PEDIATRIC DERMATOLOGY

DERMATOLOGY

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DEDICATION

To those of the pediatric specialty
who have given unfailingly of their best
to build healthy bodies and sound minds in children
this book is respectfully dedicated

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Preface

I HAVE WRITTEN this book in an attempt to fill the demand for a textbook on pediatric dermatology that is of practical usefulness and importance from a clinical point of view It is designed for pediatricians, general practitioners, teachers and students and it contains the sum of dermatologic knowledge essential in the care of infants and children.

It had its beginning, in 1928, in a series of lectures and practical demonstrations to the graduate student body at the Children s Hospital of Philadelphia. This series I initiated at the request of the late Dr Howard Childs Carpenter Vice Dean of the Graduate School of Medicine, Department of Pediatrics, University of Pennsylvania. Continuing as part of the program in pediatric dermatology the course evolved and developed with advances in knowledge. It is now part of the curriculum at the Jefferson Medical College and is comprised of weekly lectures, demonstrations and conferences conducted in the clinics of the Pediatric Outpatient Department. From this background, first in pediatrics and then in teaching and practice in pediatric dermatology I have had the temerity to attempt to fill the need for such a text—a need expressed by my own postgraduate students and others throughout the profession who urged me on.

If this book succeeds at all in its primary purpose, both my own students and those in other schools, as well as large numbers of pediatricians and general practitioners, should no longer through no fault of their own, find themselves diagnosing bizarre skin conditions and difficult diagnostic problems as eczema, for want of better information, and using "hit or-miss methods of treatment at the risk of worsening the condition. Rather they should be equipped to make careful diagnoses and to utilize wisely the therapeutic armamentarium.

I should like to express here my gratitude to those from whom I myself have learned so much and to those who helped in other ways in the preparation of this volume, both by encouragement and by generosity in allowing me to quote from their works and to use their photographs. Their names alone would fill a chapter and so the best that could be done was to select a few key references to include at the ends of chapters and to state the sources of the illustrations in the legends.

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Introduction

THE SCIENCE of dermatology deals with the skin and its adnexa, the hair and nails, the subcutaneous tissues and the sebaceous, sweat and apocrine glands. The mucous membranes also may be regarded as part of the integument. With the possible exception of the apocrine glands, which are usually quiescent during childhood, all skin structures that are subject to disorder in adult life may be affected before puberty.

FREQUENCY OF SKIN DISORDERS IN CHILDREN

The pediatrician probably finds that from 13 to 20 per cent of his patients come to him with skin disorders of one type or another. This is

TABLE 1.—The Relative Frequency of the Most Frequent Seven Among 600 Cases of Skin Disorders in Children Under 12 Years of Age*

		%
Eczema		[illegible].5
Tinea		11.5
Impetigo		10.0
Nevus		9.0
Scabies		7.0
Pyoderma		6.0
Pediculosis		4.0
	Total	[illegible]0

*From study by Tauber, E. B. (Arch. Pediat. 47 [illegible] July 1930) over [illegible] ten-year period. He took his series from private practice, hospital practice and clinic records (200 from each). The remaining 31 per cent included acne vulgaris, burns, drug rashes, urticaria, erythema, dermatitis [illegible] psoriasis, syphilis, alopecia, [illegible], pyoderma and [illegible].

large proportion in view of the wideness of range of the skin disorders. When it is realized that many systemic and infectious diseases, which constitute a large part of the remainder of his practice, produce cutaneous manifestations, it is plain that dermatology is of great importance to the pediatrician and his patients.

One author recently analyzed the composition of a pediatric practice over a ten-year period and found that the incidence of diseases of the integumentary system was exceeded only by that of respiratory infections. In another study skin diseases accounted for 13 per cent of private and 16.5 per cent of hospital pediatric practice. A third authority has found

TABLE 2.—Incidence of Skin Disease Among 1,696 Infants and Preschool Children*

Age	No. of Cases Observed	No. Showing Skin Eruptions	%
Under 1 yr.	825	246	29.9
1-2 yrs.	650	68	10.4
2-6 yrs.	221	35	11.0
Totals	1,696	349	21.1

Colored children, 306 (18%)
Skin eruptions among colored children, 16%

*From report by Rivers, [illegible] and Ore, M. (J. Pediat. 16:100, February 1940). [illegible] obtained their material from two baby health stations in New York City Department of Health.

that 16.4 per cent of pediatric patients from urban, suburban, rural and industrial neighborhoods were afflicted with some of the derma

ruca, pediculosis capitis and lichen urticatus. Less frequent dermatoses were alopecia, dermatophytosis, insect bites and psoriasis.

In general, the results of the investigators quoted in Tables 1–5 confirm the experience of most dermatologists whose patients are within the pediatric age. It certainly appears, for instance, that infants are more prone to skin disorders than preschool children, and that preschool children are more prone to them than school children. Most of the diseases occurring in the two groups are either preventable or can be reduced in intensity and extent. During school age the transmissible diseases occur with greater frequency for obvious reasons. These too, of course can be prevented.

The Child's Skin and the Adult's

The fact that the child is more susceptible to certain infections and systemic disorders than the adult, and that his reaction to them and his response to therapy also are different, are true also in dermatology. Because of the greater delicacy of the child's skin as well as other extrinsic and intrinsic factors, the clinical manifestations of the cutaneous diseases in children in many instances differ from those of adults (Fig. 1). For example, in the infant with congenital lues, the vesiculobullous lesions are seen, but they are not seen in the adult; in the child, Acarus scabiei produces vesicles, but in the adult it practically never does so; in the child, herpes zoster usually is not accompanied by pain or burning whereas in the adult these are often severe even before the eruption appears; in the child with dermatitis herpetiformis, the typical grouping of lesions is rarely in evidence. It can never be said therefore that so far as his integument is concerned, the child is "just a little man."



Fig. 1.—Photomicrographs of normal skin of A, 6-day-old infant and B, an adult. Note lacy appearance of the poorly developed stratum corneum in the infant's skin in contrast to the well defined barrier of the stratum corneum in the adult.

toses. Still another has reported an incidence of 21 per cent among infants and children at two baby health stations of the New York City Department of Health.

Because of numerous variables such as climate, socio-economic status race nutrition hygiene somatic make-up and heredity one can seldom if ever compare one study on the incidence of skin diseases with another and state with assurance that one investigator has "confirmed the results" of another Differences in classification of skin diseases add to the difficulty Nevertheless, certain generaliza-

TABLE 3—INCIDENCE OF SKIN DISEASES AMONG 1,696 INFANTS AND CHILDREN BY AGE GROUP

F[illegible] ions O[illegible]	U[illegible]der One Year	One to Two Years	Two to Six Years
Infantile eczema	48	7	1
Folliculitis with dermatitis of face	57	4	0
Nevi, including hemangioma	48	3	5
Seborrheic eczema	38	5	3
Impetigo	38	9	2
Miliaria	14	7	
Sunburn	2	0	1
Papular urticaria with eczema	9	9	3
Insect bites	5	3	3
Miscellaneous	7	1	4

From report by Silvers S. H. and Coe M. (J Pediat 16 180, February 1940) who obtained their material for study from [illegible] baby health stations in New York City Department of Health.

TABLE 4—ANALYSIS OF 1,760 RECORDS OF PATIENTS ATTENDING A SKIN CLINIC†

Disease	%	No. of Pts
Impetigo	18	203
Eczema	14	159
Dermatitis venenata (eczema)	9	101
Scabies	8	93
Ringworm of scalp	3	43
Hemangiomas (cavernous)	7	87
Verruca vulgaris	6	68
Verruca pl[illegible]ntaris		8
Dermatomycosis (athlete foot)	3	39
Pityriasis rosea	1	20

†From [illegible] nal[illegible] by Dixon H. A. (Canad M. A. J. 59 [illegible] September 19[illegible]) of the [illegible]60 patients attending the [illegible] [illegible] at the Hospital for Sick Children Toronto during one [illegible]

tions can be made with some safety based on reports of a number of surveys.

Thus it appears that the contagious or transmissible diseases (impetigo scabies and tinea) head the frequency list when they are considered together followed by those of allergic origin (eczema and dermatitis venenata) Some investigators find that impetigo contagiosa is

TABLE 5—THE DERMATOSES MOST FREQUENTLY FOUND IN VARIOUS AGE GROUPS‡

A[illegible] Age (According to Goodma[illegible])	A[illegible] Age (According to Schneide[illegible])	Under 15 Years (According to Arena and Harris)
Eczema	Dermatitis venenata	Eczema
Tinea	Eczema	Impetigo
Acne vulgaris	Acne	Scabies
Scabies	Tinea	Allergic dermatitis
Psoriasis	Seborrhea	Pediculosis
Seborrhea	Impetigo	Ringworm
Impetigo	Warts	*Urticaria*
Urticaria	Scabies	Intertrigo
Dermatitis venenata	Psoriasis	Angioma
Alopecia	Urticaria	Erysipelas
	Alopecia	Miliaria
	Pruritus	Burns
	Pediculosis	Dermatitis venenata
		Herpes simplex

Co[illegible] ge Age (According to Alderson and Roch)	Co[illegible] ge Age (According to G[illegible]bma[illegible])	High School Boys (According to Meyers)	High School Girls (According to M[illegible]er)
Tinea	Tinea	Acne	Acne
Pyoderma	Acne	Eczema	Warts
Dermatitis venenata	Seborrhea	Warts	Nevi
Seborrhea	Warts	Scabies	Dermatophytosis
Acne	Pyoderma	Herpes simplex	Seborrhea
Warts	Dermatitis venenata	Trichophytosis	Herpes simplex
Sebaceous cysts	Eczema	Ichthyosis	Tinea
Urticaria	Pityriasis rosea	Psoriasis	Ichthyosis
Pediculosis pubis	Moles	Pityriasis rosea	Hypertrichosis
Herpes simplex	Herpes zoster		Eczema
			Impetigo
			Roentgen ray dermatitis
			Neurodermatitis

‡From M[illegible] [illegible] J. J. Arch. Derma[illegible] & Syph. [illegible] 175 September 1[illegible]40

at the top of the list others that the eczemas occur most frequently In my own recent study of 967 children in the outpatient clinic of a large city skin hospital, the ten most common dermatoses occurred in the following order of frequency tinea capitis, atopic dermatitis, impetigo contagiosa and pyoderma scabies dermatitis venenata nevi and angioma seborrheic dermatitis of scalp and body ver-

rosea, pediculosis capitis and lichen urticatus. Less frequent dermatoses were alopecia, dermatophytosis, insect bites and psoriasis.

In general, the results of the investigators quoted in Tables 1-5 confirm the experience of most dermatologists whose patients are within the pediatric age. It certainly appears, for instance, that infants are more prone to than the adult, and that his reaction to them and his response to therapy also are different, are true also in dermatology. Because of the greater delicacy of the child's skin as well as other extrinsic and intrinsic factors, the clinical manifestations of the cutaneous diseases in children in many instances differ from those of adults (Fig. 1). For example, in the infant



Fig. 1.—Photomacrographs of normal skin of A, 6-day-old infant and B an adult. Note lacy appearance of the poorly developed stratum corneum in the infant skin in contrast to the well defined barrier of the stratum corneum in the adult.

skin disorders than preschool children, and that preschool children are more prone to them than school children. Most of the diseases occurring in the two groups are either preventable or can be reduced in intensity and extent. During school age the transmissible diseases occur with greater frequency for obvious reasons. These too, of course, can be prevented.

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THE APPROACH TO DIAGNOSIS

The beginner in dermatology must train himself *insistently to recognize skin diseases* by what he sees rather than by what patients or parents tell him. Thus the practiced *eye sees* the color and distribution of lesions and can recognize many of the dermatoses directly Many times recognition of the *type* of individual lesions will serve to narrow the diagnostic field by placing the dermatosis in a particular group Similarly the *etiology* may be determined. For example, perhaps a patient's erythema multiforme is caused by ingestion of *a particular food* or drug. Those impetiginized lesions occurring upon buttocks and external genitalia of another *patient may be secondary* to scabies. And the impetigo occurring upon a third patient's scalp face and ears will be cause for a search for ova and pediculi on the scalp

In examining a patient, therefore, the physician should ask himself three general questions (1) What are the component parts of the eruption? (2) What is its distribution? Where are the lesions located? (3) Is the eruption acute subacute or chronic? The answers to these questions often lead directly to the diagnosis. At the same time the mucous membranes of mouth eyelids nose, vagina urethra and anus must not be ignored. Lesions on mucous membranes frequently serve as diagnostic clues.

1 COMPONENT PARTS OF THE ERUPTION —The lesions may consist of macules papules vesicles maculopapules, vesicopapules *bullae etc. as described in Chapter 3* It should be remembered that certain drugs, among them the bromides, iodides and sulfonamides, produce various kinds of skin lesions that vary from erythematous and bullous to verrucous and nodular

2. DISTRIBUTION —Certain skin diseases are known to *have characteristic distributions* Ringed (i.e circinate) eruptions may be *due to ringworm* of the glabrous skin or congenital syphilis. Lesions of seborrheic dermatitis are found upon areas of the skin that are heavily endowed with sebaceous glands that is the scalp behind the ears, over the glabella, the eyebrows, the lateral *aspects of the nose, the chin,* axillae groins, umbilicus and over the skin that covers the spinal column. Scabietic lesions, in typical uncomplicated cases, are seen over the flexor surfaces of the wrists, the elbows the anterior axillary folds, beneath the breasts, the intergluteal folds the lower half of the buttocks, around the umbilicus and upon the external genitalia. In nurslings, lesions are found upon the face in infants the palms and soles are frequently involved.

3 ACUTE SUBACUTE OR CHRONIC.—*It is* important to recognize the stage of a dermatosis, since not only diagnosis but the type of treatment will depend upon the phase of the inflammatory reaction A sick skin that is *acutely* inflamed is recognized by the presence of erythema, maculopapules or papulovesicles with edema (sometimes described as weeping of the lesions) and subsequent *crust formation. A subacute dermatitis* is one in which the acute lesions show definite improvement While such a skin may still show evidence of erythema with slight exudation it appears definitely milder and improved when compared to the acute exudative stage. In the *chronic* stage the skin is *dry* infiltrated and has a leathery feel and appearance the linear markings are exaggerated and the term *lichenification* is applied. Only too often *however the stages* are *merged* with one superimposed upon another as the cycle of events repeats itself In atopic dermatitis the frequent recurrences *of the acute* phase constitute a characteristic feature the stage of exudation improves with proper management *is followed by a* subacute and chronic stage and later by another acute *erythematous exudative stage*

The importance of training the eyes to see cannot be emphasized too strongly In fact, it is a good plan in the routine examination of infants and children to make a tentative diag

nosis by inspection alone. The habit, once formed, of careful and accurate observation, not only often provides a diagnostic answer early but enhances immensely the value of careful and methodical physical examination and history taking as discussed in Chapter 4. A knowledge of applied histology and physiology of the skin is also basic and is reviewed in Chapter 2.

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2 Applied Histology and Physiology of the Skin

IF A LONGITUDINAL section of normal skin is examined under a microscope it will be found to consist from above downward of two main portions, viz (1) the epidermis or false skin and (2) the cutis, corium or true skin The epidermis is further subdivided into five layers (1) the stratum corneum or horny layer (2) the stratum lucidum (3) the stratum granulosum or granular layer (4) the stratum spinosum or spindle cell layer (squamous cell layer) and (5) the stratum germinativum or basal cell layer The stratum lucidum is found only on the palms and soles. A simplified diagram appears in Figure 2.

The epidermis has been referred to as "the king of the tissues for it is in the basal layer of the epidermis that new cells are constantly being manufactured (stratum germinativum) As new cells are developed in this lowermost layer they are in turn transformed into prickle (squamous) cells then into cells that constitute the granular layer and the stratum lucidum When the cells reach the stratum granulosum they flatten out, lose their nuclei and become part of the stratum corneum or horny layer This process of manufacturing new cells and getting rid of the old cells (dead cells) goes on constantly Then too the epidermis has great resistance withstanding variations in temperature in this respect, the epidermis is unique among the organs of the body

The second layer of the skin the corium derma or cutis, is subdivided into three parts (1) the papillary or outer layer (2) the reticular or middle layer (3) the inner or subcutaneous connective tissue layer The pars papillaris or papillary layer is that portion of the corium that borders on the epidermis. It consists of cone-shaped, finger like blunt projections arranged in more or less parallel ridges. It contains nerve filaments and loops of capillaries, venules and the smaller arterioles. The corium is composed of fibers of three types—collagenous, elastic and reticulum Of these the collagenous fibers constitute the largest number The latter are held together by means of an interfibrillary ground substance The elastic fibers permit the skin to stretch and to return to its original state when the tension is released. Fibrinoid degeneration of the collagen in the corium and similar changes in the collagen contained in other structures such as the blood vessels, glomeruli endocardium and epicardium and in serous and synovial membranes has given rise to the expression collagen diseases. Examples of collagen diseases are lupus erythematosus scleroderma, periarteritis nodosa and dermatomyositis. The remainder of the corium is called the reticular layer (pars reticularis) There is no sharp dividing line between the

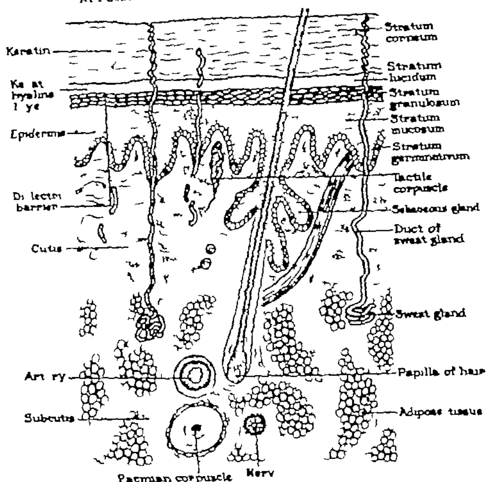


Fig. 2.—Histologic diagram of normal skin.

papillary layer and the reticular layer: the lowermost portion of the former gradually merges into the latter.

The hypoderm or subcutaneous layer has been likened to the spring of a mattress, serving the purpose of mechanical pad or buffer against external blow and violence. There is no sharp line of demarcation between the lowermost portion of the reticular layer and the subcutaneous layer, the one layer gradually merging into the other. The subcutaneous layer is a loose network of connective tissue, containing large amounts of fat which fill its meshes. The senile skin characterized by wrinkling and thinness is in part due to the disappearance of this subcutaneous layer of fat. The deeper structures of the corium, particularly the subcutaneous layer, also furnish a bed for the sweat and sebaceous glands and the hair follicles.

The appendages of the skin include the sebaceous, sweat and apocrine glands, hair and nails. These are all closely related to the epidermis and, like the latter, are derivatives of the ectoderm. It follows that in certain congenital disorders when one or more of those structures are at fault, other structures also of ectodermal origin frequently share in the disorder. Thus, for example, in congenital ichthyosis the skin is characterized by dryness and often there is also a disturbance in the sweating mechanism, for

the sweat glands and their ducts may be partially or completely absent. So too, the teeth, which are also of ectodermal derivation, may be absent or deformed in the disease known as hereditary ectodermal dysplasia.

The skin is endowed with eight functions (1) absorption, (2) secretion, (3) respiration, (4) formation of epidermis, (5) regulation of the temperature, (6) sensory perception, (7) pigment formation, and (8) production of keratin The color of the skin varies according to age race and the individual. Some areas of the skin are darker than others. The skin of the newborn is soft, velvety and smooth Soon after birth it acquires an erythema which changes to pink and becomes covered by a fine desquamation known as peeling. The white color of the skin is due to keratohyalin, a waxlike substance contained in the granular layer Accordingly the thicker the stratum granulosum the whiter the skin conversely when the stratum granulosum is thinned the skin will appear less opaque. The absence of keratohyalin from the skin of a fetus accounts for the redness of its skin. Certain areas of the body and skin such as the lips and cheeks are characterized by an absence of keratohyalin and so are red. In other words, the red color of the skin derives from the vascular supply which is in the corium but which is ordinarily obscured because of keratohyalin contained in the granular layer

The color of the skin may also be modified by pigment. Those particular cells that are charged with the function of manufacturing pigment are located in the basal cells and in the dendritic cells of the epidermis. They are known as melanocytes. Under the microscope they are seen as pigment granules. Other cells chromatophores, located in the corium do not make pigment but transport it. As has already been stated, in certain races, as in the Negro and the mulatto, the observable increase in these pigment cells located in the basal cell membrane of the epidermis may serve to identify the skin as belonging to a member of a dark-colored race

On the other hand, in certain dermatoses such as vitiligo (leukoderma) the melanocytes are greatly decreased in number and may be entirely absent Normally the stratum corneum is a transparent membrane However when it becomes thickened in certain dermatoses it assumes a whitish gray appearance The blackish or darkened color of the skin seen in ichthyosis is due to oxykeratin, an oxidation product of keratin. The color of the hair is also dependent upon pigment contained in the cortex of the hair shaft In blondes, and in hair that has turned gray the color is attributable to an actual absence of pigment

There are three kinds of glands that are of interest to the dermatologist namely the eccrine (sweat) glands, the holocrine (sebaceous) glands, and the apocrine glands. Of these, the first two are important in pediatric dermatology The chief function of the sweat glands being the elimination of water and waste products, they are important organs of excretion. The sweat glands and their ducts are well formed at the time of birth and are found over the entire skin being particularly abundant in the skin of the axillae, palms and soles. They discharge their excretion through the sweat ducts which open directly into the epidermis after entering the rete malpighii. The sweat glands are of interest to pediatricians in that they sometimes share in congenital defects. For example in hereditary ectodermal dysplasia, the sweat glands and their ducts may be poorly developed and even absent It is of interest that so-called furunculosis commonly described in most text books on dermatology as an affection of the sebaceous glands is a misnomer for the sebaceous glands soon after birth while present in the deeper structure of the skin are immature and do not function actively until the time of puberty Accordingly the condition referred to as furunculosis in infants (as also that condition spoken of as multiple abscesses of the skin) is a pyoderma (streptococcic or staphylococcic) involving the sweat glands, not the sebaceous glands (periporitis staphylogenes) The infection is usually brought about by excessive sweating during the hot season of the year in which pyodermic organisms gain entrance through the surface of the skin

Both the sebaceous glands and the sweat glands are situated in the deep cutis (subcutis). The sebaceous glands, in contrast to the sweat glands, discharge their contents after the cells have broken down into the sebaceous ducts, which also open upon the surface of the epidermis. These ducts, traversing the epidermis between the rete pegs, discharge an oily secretion which lubricates the skin. They may or may not contain hair. Infections of the sebaceous glands and their ducts, as well as the hair contained in their shafts, are of foremost importance to the pediatric dermatologist because of the widespread incidence of ringworm of the scalp (tinea capitis). Furthermore, pyodermic cocci may enter these ducts and their follicles from the surface of the skin and give rise to various types of pyogenic infection such as the acute folliculitis and chronic folliculitis (sycosis vulgaris) seen in male adults. Although the latter condition is never encountered in children, a superficial type of staphylococcic pyoderma involving and restricted to the orifice of the hair follicles, the so-called "Bockhart's impetigo," is occasionally seen in infants and children. In older children the sebaceous gland may be the site of a true furuncle or even a carbuncle but these infections also are seen with far greater frequency in adults than in children.

Dry types of skin, when the sebaceous secretion is poor or absent (xeroderma), are sometimes seen in infants and children. In congenital ichthyosis and hereditary ectodermal dysplasia, the sebaceous glands are frequently atrophied and absent. Sweating, as has already been stated, is constantly going on through the skin although we are only conscious of that kind of sweating which is perceptible (sensible perspiration). Most sweating is of the perceptible type. However, in certain congenital cutaneous disturbances, such as hereditary ectodermal dysplasia, the sweat glands and their ducts may be absent. Accordingly, loss of water through the skin in these persons occurs wholly by osmosis (insensible perspiration). Such children feel very uncomfortable during hot weather since they are not able to get rid of the heat through the skin like normal persons. It has been estimated that the adult loses on the average approximately 10 oz. (300 cc.) of water through the skin daily.

The exchange of oxygen and carbon dioxide is going on constantly in the skin, just as this process is also continuously taking place in the lungs. Normal skin loses a large amount of carbon dioxide and absorbs a certain amount of oxygen. Greases and baby oils commonly employed for cleansing and lubricating the skin tend to clog the follicles and interfere with the normal physiologic function of getting rid of sweat and secretions and with the physiologic exchange of oxygen and carbon dioxide. The skin also contains water and minerals, such as calcium, potassium, sodium, chlorine, sulfur, phosphorus, arsenic, fluorine, iodine, zinc, iron, copper, cobalt and nickel. It contains carbohydrates, fats and proteins, a number of ferments which include lipase, amylase, a proteolytic ferment and an enzyme capable of splitting cholesterin esters. The skin contains a large number of sterols, such as cholesterol and ergosterol. In the presence of natural sunlight (ultraviolet rays) or that produced by artificial means, these esters are activated, resulting in the production of the antirachitic vitamin D. The skin, like other tissues, requires water in order to carry on its physiologic functions. Such pathologic states as diabetes, diarrhea, hemorrhage, prolonged illnesses and high fever may cause the skin to lose considerable quantities of water. This is particularly common with infants who become dehydrated rapidly from such a condition as infectious diarrhea.

The minerals of the body are lost through *the skin, kidneys and in feces.* Normally the minerals of the skin, like those contained in the blood, remain more or less constant. It *is for this reason that the skin has been referred to as the "reservoir" for the minerals of the body.* When the minerals in the blood are lowered in considerable amount, *there is an immediate* interference with the physiologic functions of the body. In contrast, slight and even moderate depletion of the minerals in the skin will not interfere

with its normal functions. While all of the minerals contained in the skin are essential for metabolism calcium and potassium are perhaps those of greatest importance. A lowered calcium content of the skin results in irritability and excitability of the dermal net work. The action of potassium is opposite to that of calcium Most of the sulfur of the skin is contained in the horny layer In the hair and nails. Sulfur occurs in the form of cysteine glutathione (a sulfahydryl compound i.e. a tripeptide containing cysteine, glutamic acid and glycine) and methionine.

The sulfahydryl (mercaptan or SH radicle) is important dermatologically in that in poisoning from the heavy metals, such as gold arsenic and mercury it has a great affinity for them. The combination of the SH radicle with the heavy metals interferes with the enzymatic action (the pyruvate oxidase) system which functions through the tissue SH group so that intoxication is prevented by the rendering inert of the heavy metals. This is the principle upon which is based the use of BAL (British Anti Lewisite) which proved successful in overcoming poisoning by the heavy metals during the Second World War The use of BAL in the treatment of children and infants with acrodynia is apparently working out satisfactorily as acrodynia is apparently caused by mercury intoxication.

Recently considerable interest has been aroused in the intracellular substance of the connective tissue in various dermatoses particularly in the enzymotic hydrolysis of the viscous substance which may play an important role in the protective mechanism of the organisms and be of primary significance in tissue regeneration. Chemically the intercellular substance of cutaneous connective tissue is made up of mucopolysaccharides, chiefly hyaluronic acid and chondroitin sulfuric acid. Pure hyaluronic acid is found in the synovial fluid, in the vitreous humor with equal amounts of chondroitin sulfuric acid, and in the jelly of Wharton in the umbilical cord It is presumed to be secreted by the young fibroblasts. It would seem that the amount state and composition of the intercellular substance depend upon thyroid function possibly by way of variations in the concentration of hyaluronidase in the tissues.

The skin is permeable to water fats lipoid substances, lipoid suspensions and volatile substances. Absorption through the skin into the deeper tissues takes place mostly through the pilosebaceous glands. Thus it is that the pilosebaceous openings, representing the weakest points on the skin surface are not only entrances for infection by bacteria but are also the avenues by which medicaments applied on the surface may penetrate into the deeper structures. Systemic effects may result from the application of topical remedies in the form of ointments creams and liniments. Instances of poisoning have been reported from the local application of chrysarobin yellow oxide of mercury ointment, ammoniated mercury ointment, coal tar ointment and from pure coal tar applied to the skin When such remedies are used continuously or over extensive areas of the skin frequent urinalyses should be carried out routinely and the physician should be on guard to detect the early symptoms of poisoning Recently considerable interest has been aroused among pediatricians by reports in the literature of poisoning and deaths caused by the topical applications of boric acid used as a wet dressing and also in the form of an ointment for the treatment of skin conditions in infants

The stratum corneum is poorly developed following birth and for a considerable period during early infancy While this layer serves as an effective barrier against infection from the outside world in older children and adults, it is inefficient as a protective covering during early life. Accordingly skin infections caused by streptococci and staphylococci are frequently seen among infants and younger children. Injuries to the skin of the newborn through handling and abrasions incident to trauma by strong alkaline soaps and by chemicals further assault the delicate skin that has been mechanically or physically injured. It is then that saprophytic organisms of the pyogenic type normally harmless are activated and impetigo contagiosa results

The surface of the normal skin has an acid reaction. The pH of the normal skin varying from 3.5 to 7 is spoken of as the acid man

tle of the skin. Some skins are oily others are dry Environmental conditions, thickness or thinness of the skin, differences in hair covering, texture, pigmentation, race and similar factors tend to alter the surface characteristics of the skin. Physiologically pigment serves to prevent injury from the sun's rays to the deeper structure. Nature also prevents injury of the underlying structures of the skin by producing a coat of tan which acts protectively The sweat glands serve chiefly to excrete waste products and to regulate the body temperature, while the sebaceous glands serve as lubricants, since they manufacture the fats. On the other hand, internal and external causes such as fevers, dietetic errors, organic disease, nervous changes, disturbance of glandular function, trauma and chemical action challenge and interfere with these protective functions.

The physiologic functions of the skin during infancy and childhood are similar to those of adult life, except that some of the functions of the skin are not fully developed. Pain and temperature sense, for example, are both absent at birth. Accordingly special care should be exercised in the application of a hot (or warm) water bottle and in the topical application of counterirritants, such as the mustard plaster (a practice now almost obsolete) when such measures are indicated. The heat regulatory mechanism is labile during early life. Trivial causes such as constipation or excessive crying may elevate the normal temperature of a young infant several degrees. The sebaceous glands are relatively inactive during infancy and early childhood.

3 Primary and Secondary Lesions

THE CLINICAL pictures of the dermatoses in infants and children are composed of lesions arranged singly or in various combinations. Thus in herpes simplex of the upper lip one finds a patch of discrete vesicular lesions upon an erythematous base which sometimes becomes crusted (impetiginized) Again in impetigo contagiosa the primary lesion is a vesicle, the contents of which soon become cloudy the ensuing rupture of the vesicle and drying of the exudate result in a crust. In a number of dermatoses the eruptions occur in characteristic patterns.

It is not always easy to identify the primary lesions of a skin eruption inasmuch as scratching and rubbing of the skin rash frequently distort the original picture. Too the use of various medicaments prescribed by the physician or employed through the advice of friends may aggravate the rash by reason of the strong chemicals in many proprietaries which traumatize the skin and act as irritants. Accordingly the lesions of many skin conditions when seen by the dermatologist, have been complicated by traumatic injury (therapeutic dermatitis) and show evidence of a so-called dermatitis venenata (contact dermatitis) In many instances, therefore, before remedies can be prescribed to improve the condition for which special dermatologic care is sought, the dermatologist has first to direct his attention to the management of the complicating condition. It is in accord with these facts that bizarre and complicated clinical configurations arise often confusing and tending to make diagnosis more difficult However from the academic point of view and also in the interest of simplicity of presentation it is best to divide the clinical features of the various dermatoses into two groups—the elementary or primary lesions and the secondary or consecutive lesions.

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Frequently various combinations of primary lesions may be seen on the skin at the same time The presence of papules and vesicles is spoken of as papulovesicular or vesicles and pustules in combination are known as a vesiculopustular eruption There are only eight primary and seven secondary skin lesions. The *primary* ones are macules papules vesicles, pustules, nodules, wheals bullae and tumors. The *secondary* ones are crusts, scales

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In addition to the general skin reactions creating lesions, there are also many eruptions that are generalized and some that are localized. They are the following

GENERALIZED.—Eczema, exanthemata, scabies, psoriasis, syphilis.

LOCALIZED.—*Face*: acne eczema, impetigo ringworm.

Chest. psoriasis, tinea corporis, pityriasis versicolor acne.

Scalp alopecia, pediculosis, eczema, ringworm.

Back. psoriasis, acne, pediculosis vestimenti.

Hands. verruca, eczema, ringworm.

Extensor Surface of Arms and Wrists: urticaria, erythema multiforme, and ichthyosis.

Flexor Surface of Arms and Wrists: lichen planus, scabies.

Legs: ichthyosis, ringworm, scabies, ecthyma.

As Tauber has stated, after location we have in configuration a distinct aid to our general diagnosis, for example, the serpiginous or circinate outline of syphilis, the round bald patch of alopecia areata and trichophytosis, the map-like border of psoriasis, the oval or egg-shaped lesions or erythema nodosum and gummas, the angular or polygonal flattened papules of lichen planus, the annular distribution in erythema iris and pityriasis rosea, and the grouped vesicles upon reddened bases over the course of the nerve in zoster

PRIMARY (ELEMENTARY) LESIONS

MACULE.—A macule is a spot or stain. Macules are always found to be on the level of the skin and are never elevated. They may be of various colors—red, blue, white, purplish, yellowish. The macular syphilide, the macules of measles and the port-wine stain (nevus flammeus) are examples. A macule may become papule and both lesions may be seen on the skin at the same time (maculopapular syphilide)

PAPULE.—A papule, in contrast to a macule, is an elevated lesion, that is, it protrudes above the level of the skin. Papules vary in size from pinhead to pea. When papules fill the outlet of hair follicles they are known as follicular papules: for example, the lichenoid tuberculid. When papules become infected or purulent they are known as papulopustules: for example, the papulopustular syphilide. Frequently papulopustular lesions become crusted. The common wart and the lesions of lichen urticatus are other examples of papules.

VESICLE.—A vesicle is a superficial cyst like elevation of the skin containing fluid. Vesicles vary in size from pinhead to pea. The fluid content may be clear or may contain blood, pus or lymph. They are usually due to some inflammatory process and when this is so may contain blood. Vesicular lesions seen upon palms and soles are generally flatter than similar lesions found upon other parts of the skin. This is due to the thickened layer of the stratum corneum upon those particular areas of the skin. Vesicles are commonly referred to as "blisters. They may be unilocular (varicella) or multilocular (variola) Histologically vesicles are seen either in the stratum corneum or in the superficial layer of the epidermis (impetigo contagiosa) or subepidermally (dystrophic type of epidermolysis bullosa) Typical examples of vesicular lesions are found in such diseases as the common cold sore (herpes simplex) and in chickenpox.

PUSTULE.—A pustule is a circumscribed elevation of the skin containing pus. Pustules may be tiny the size of millet seed, or the size of a small cherry Pustules may exist either as a primary lesion or the primary lesion may become infected and the pustule superimposed upon it. Pustular acne and the varioliform pustules seen in smallpox are examples. Impetiginized lesions are seen in such diseases as atopic dermatitis (eczema) and scabies and are caused by trauma incident to scratching.

The term abscess designates a localized collection of pus which occurs when the inflammatory process has extended and invaded the subcutaneous tissue. Destruction of the subcutaneous tissue is followed by repair (scar formation)

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zema and in pediculosis capitis. It should be pointed out that lesions that are restricted to the stratum corneum and epidermis heal by regeneration while lesions that involve the deeper structures, such as the corium, heal by repair and scar tissue formation. An example of the latter type of injury is to be found in ecthyma or in a deep cut, but not in a scratch.

ULCER.—An ulcer is the result of destruction of both epidermis and corium. When healing takes place the end result is a scar. Therefore, the expression "superficial ulceration" is a misnomer since in this condition the epidermis alone is involved. Accordingly healing in a superficial ulcerative wound is followed by regeneration and not by repair of the damaged tissue. Varicose ulcers and syphilitic ulcers are examples of true ulcerations of the skin.

FISSURE (rhagade).—A fissure (or rhagade) is a crack in the skin which is caused by a disproportion between the elasticity of the skin and the movement of the part. Fissures usually occur at a mucocutaneous junction, on the palms and soles and also on the small articulations of the hands, feet and fingers. The horny layer of the skin (stratum corneum) is not elastic but is kept lubricated from the sebaceous glands. Accordingly rhagades are found on those areas of the skin where there are no sebaceous glands. A fissure or series of fissures upon the mucocutaneous junction, or corners, of the mouth is spoken of as perlèche. The rhagades seen in congenital syphilis, and the fissures in intertrigo and in atopic dermatitis (eczema) are other examples.

SCAR (cicatrix).—A scar (or cicatrix) is the end result of damage to the skin involving the corium. The affected tissue is at first replaced by granulation tissue, composed of fibroblasts, which ultimately heals producing a scar. Scar tissue is evidence that repair and not regeneration has taken place. Hypertrophic scars are keloids. Chemical burns—for example, those produced by sulfuric, nitric or some other strong mineral acid—are noteworthy instances of injury to the skin that is followed by scar formation. Syphilitic scars and the scarring following the healing of the lesions of erythema induratum (Bazin's disease) are further examples of true scar formation.

PIGMENTATION AND DEPIGMENTATION.—Many dermatoses are accompanied by increase of pigment, others by a disappearance of pigment. This is particularly the case in colored children and others who are dark skinned.

In addition to the primary and secondary skin lesions there are still others that do not readily lend themselves to classification. Among them might be mentioned the comedo seen in acne vulgaris and tar acne and the cuniculus or burrow seen in scabies and in larvae migrans. These are discussed in the appropriate chapters.

REFERENCE

Tauber, E. B.: Arch. Pediat. 50:173, March, 1933.

NODULE.—In reality a nodule is a large papule varying in size from pea to cherry. Nodules, *in addition to being larger than papules*, also have depth, that is, they invade the deeper structures of the skin, in contrast to a papule, which is an elevated lesion. Nodules may even invade the deeper layers of the corium and the subcutaneous tissue. Examples of nodules are found in leprosy (nodular lepromatous lesions) and in tertiary syphilis (tuberous syphilides).

WHEAL.—A wheal is an edematous, short-lived papule. The fact that wheals are of short duration or evanescent, is of considerable diagnostic help in such skin disorders as urticaria, urticaria pigmentosa, serum sickness, etc., *which are characterized by a whealing phenomenon*. Wheals vary in size from pinhead to chicken egg and even larger. In some instances wheals may be as large as the palm of the hand (giant hives). The extreme blanched white appearance of the wheal, such as is seen in urticaria, is due to compression of the superficial blood capillaries. Wheals follow bites and stings of insects and form the typical lesion seen in urticaria.

BULLA.—A bulla is a bleb or large vesicle. Bullae are usually the result of congestion in inflammatory processes. The bullous lesions of impetigo contagiosa are a common example. In epidermolysis bullosa hereditaria it is generally believed that the bullae are due not to inflammation but to a congenital inherited weakness of the elastic tissue. The inciting cause in the latter condition is trauma such, for example, as pressure on the foot by a tight fitting shoe. Bullae may be produced experimentally by the local application to the skin of the Spanish fly plaster (Emplastrum Cantharides) or cantharides cerate. In both preparations, the active principle responsible for producing the blister is cantharidin. Bullae may also follow *second degree burns and scalds.*

TUMOR (node).—When a nodule becomes large it is referred to as a tumor. There are all kinds of tumors. Some are the result of localized hypertrophic changes of the skin, others, such as epithelioma and sarcoma, are new growths. A tumor may be seen as an acute inflammatory process, such, for example, as that in the common boil and carbuncle. Typical examples are to be found in such diseases as erythema nodosum, in which lesions often appear in front of the leg and may reach the size of a goose egg. Juxta-articular nodes are seen around the joints in syphilis and in leprosy. Chronic inflammatory nodes are seen in tuberculosis, syphilis and the lymphoblastomas.

SECONDARY (CONSECUTIVE) LESIONS

CRUST (scab).—Crusts are the result of the drying of the fluid exudate and pustular elements which in turn were the result of inflammatory processes. The superficial wafer-like crusts seen in impetigo contagiosa and the crusted lesions in atopic dermatitis (eczema) are examples.

SCALE.—A scale is a hyperproduction of the normal horny area of the skin. Physiologic scaling is a normal process, constantly going on during our life time, by which dead skin is shed and replaced by new skin. Under pathologic conditions, abnormal scaling is seen to occur in such dermatoses as psoriasis, seborrheic dermatitis and ichthyosis. In psoriasis the heaped up, thickened silvery scales are described by the adjective mother-of-pearl. The scales seen in seborrheic dermatitis are often oily and of a greasy nature. While pathologic scaling is usually the result of inflammatory processes of the skin, a notable exception is to be found in ichthyosis, in which condition the scales are the result of a congenital defect of the skin.

EXCORIATION.—Excoriations are also known as abrasions or erosions. They are essentially breaks in the continuity of the epidermis as the result of trauma by scratching, etc. Erosions, as a rule, are quite superficial and are limited to the horny layer and part of the epidermis. Excoriations are commonly seen in scabies of children (but not among young infants), in ec

The terms "tubercle" and "nodule" are often used synonymously. It is the w[illegible]ter's feeling that the term "tubercle" should be abandoned when speaking of nodule, since in the strict sense of the word it connotes lesions d[illegible] t[illegible] used by th[illegible] t[illegible] bercle ba[illegible]ll[illegible]

rhage, induration, atrophy hypertrophy tumor or parasitic (animal or vegetable)

7 *Modification* of lesions
By natural or accidental causes. Treated or untreated. Scratch marks. Deductions to be derived from scars, stains and above.

8 *Stage of development* of lesions
Whether lesions are increasing in size and number or whether they are diminishing.

TABLE 7.—METHOD OUTLINE FOR TAKING A HISTORY

Name of Patient
Race
Sex
Age (stating exact date of birth)

1 FAMILY HISTORY
Father: Age, condition of health, or date of death and cause.
Mother Age condition of health or date of death and cause.
Pregnancies. 1 Boy: Age, health, or age at death and cause.
2 Girl Age, health or age at death and cause.
3 Miscarriage and cause

Make a negative statement of the family history of syphilis, tuberculosis, allergy (stating particular type: hay fever asthma, atopic dermatitis, migraine, angioneurotic edema, chronic urticarial episodes, etc.) or other conditions bearing on present condition of patient.

State father' occupation and that of others in the family Inquire into condition of any former occupants of the home and any present occupant not of the family Inquire into condition of others in the home who have contagious skin diseases such as scabies, impetigo, ringworm, pediculosis, also, whether there are animals, such as cats and dogs, and their condition.

Do any of the child' playmates have contagious skin diseases such as impetigo, scabies and ringworm

Inquire as to hereditary and familial diseases, as adenoma sebaceum, von Recklinghausen disease epidermolysis bullosa hereditaria, etc., and other conditions that may be present in members of the family

2 PAST HISTORY
A Birth At term or premature, character of delivery condition of patient immediately after birth, birth weight.
B Health during infancy Fever convulsions, cyanosis, eruptions (type, character distribution, treatment) snuffles, desquamation, hemorrhages, etc.
C Development Weight gain, age of holding up head, sitting up alone talking; time of appearance of first tooth, age full set (number) beginning of school and progress general intelligence of child associates and attitude of child toward other children.
D Feeding Breast or artificial, duration and intervals of artificial feeding, present diet before onset and after onset of present illness. (Record feedings separately after Roman numerals I, II III etc., one numeral for each feeding change.) Inquire regarding candy cake, chocolate, ice cream idiosyncrasies, likes and dislikes of particular foods, aversions to particular foods, and eating between meals.
E Personal habits Daily routine, habit of sleep with whom, etc. Condition of bedroom, animals in house (cat dog) type or types of exercise, constipation and kinds of laxatives used.
F Diseases Make positive statements and give age as to diphtheria, scarlet fever measles, pertussis, German measles, roseola infantum, varicella, etc. Give date and age for any other illnesses and inquire as to cardiac respiratory gastrointestinal and genitourinary system.
G Prophylaxis T.A.T vaccination, typhoid fever Schick test, Dick test, poliomyelitis etc., triple immunologic injections, booster doses (give dates)

3 PRESENT ILLNESS (DERMATOSES)
Complaint In parent's, patient's, or relative's own words, summarizing when necessary Cause of rash, if it is possible to elicit it.
Onset Date and character (month day year)
Distribution Where did rash first start and which areas of the skin were involved subsequently? (Describe as symmetrical, asymmetrical give general topography etc.) Duration.
Course Evolution as completely as possible, especially as to changes in appearance and signs and symptoms with data. State whether condition better or worse at present.
Symptoms. State the most annoying symptoms of which patient now complains State objective and, when possible, subjective symptoms as completely as possible (When given under Onset and Course, these need not be repeated.)
Treatment From beginning of eruption to present time Detail types of therapy in chronologic order including the number of treatments obtained by means of roentgen therapy physical therapy and their result. Idiosyncrasies and untoward reactions to drugs (e.g., sulfonamides, penicillin, white precipitate ointment, etc.) and side effects should be noted in detail.

4 PARENT-CHILD RELATIONSHIP
It is good plan to form general impression of the quality of the parent-child relationship. Note the following points Is the mother responsible or irresponsible, fearful or aggressive, dependent and passive, or rigid and uncompromising? Is there evidence of maternal over solicitude, which infantilizes the child below its years Or is there rejection, putting too great a

4

Physical Examination and History

A CAREFUL *physical examination and a history taken with care and exactitude are of inestimable value to the clinician. His record of the patient's state of health at the time of his first visit becomes a permanent one and so forms a comparative reference sheet for all subsequent examinations.*

Because of the special importance of vision in the recognition of skin diseases it is well to perform the physical examination before taking the history This is not to minimize the importance of the history however since it is an important aid in the interpretation of signs and symptoms and an essential part of the clinician's record of his patient. The pediatrician or the general practitioner will, in fact probably wish to follow much the same order of events for his patients with skin disorders as he does with his other patients, and there is no reason why he should not Furthermore in some instances—for example when the child shows signs of being shy unruly or in any other way difficult—it may be desirable to precede the physical examination with the longer conference that history taking entails in order to gain his confidence

Both physical examination and history taking are time consuming especially on the patient's first visit, and it is well worth the clinician's while to be methodical The salient features of both procedures are summarized in Tables 6 and 7 in this chapter arranged in the methodical order which this author has found the most rewarding

TABLE 6.—SALIENT FEATURES OF A PHYSICAL EXAMINATION

1 *Inspection* of entire patient if possible
   (a) Age, (b) sex, (c) school station, etc
2 *Distribution* of eruption
   Whether localized circumscribed, limited, symmetrical or asymmetrical unilateral or bilateral, general or universal mucous membrane
3 *Configuration* of eruption
   Whether angulate annular circinate, corymbose crescentic, discoid, figurate geographic gyrate horseshoe irregular linear marginate moniliform nummular orbicular oval parallel polygonal, punctate ragged, reniform reticular ringed, serpiginous sharp scalloped striated.
4 *Type or topography* of eruption
   Uniform (i.e one type of primary lesion) or multiforme (so-called "mixed eruption) Singular uniform, isolated confluent or discrete grouped disseminated, multiple polymorphous.
5 *Type* of lesion
   (a) Primary or essential macule papule nodule tumor wheal vesicle bulla pustule
   (b) *Secondary scale crust excoriation fissure ulcer cicatrix pigmentation*
6 *Nature* of lesion
   Whether erythema inflammation, hemor

1 this method, which has been followed in ... teaching of students, the author is indebted to Dr Eugene F Traub

rhage, induration, atrophy hypertrophy tumor or parasitic (animal or vegetable)

7 *Modification of lesions*
By natural or accidental causes. Treated or untreated. Scratch marks. Deductions to be derived from scars, stains and bows.

8 *Stage of development* of lesions
Whether lesions are increasing in size and number or whether they are diminishing.

TABLE 7.—METHOD OUTLINE FOR TAKING A HISTORY

Name of Patient
Race
Sex
Age (stating exact date of birth)

1 FAMILY HISTORY
Father Age, condition of health, or date of death and cause.
Mother Age, condition of health, or date of death and cause.
Pregnancies. 1 Boy Age, health, or age at death and cause.
2 Girl Age, health or age at death and cause.
3 Miscarriage and cause.

Make negative statement of the family history of syphilis, tuberculosis, allergy (stating particular type hay fever asthma, atopic dermatitis, migraine, angioneurotic edema, chronic urticarial episodes, etc.) or *other conditions bearing on present condition of patient.*

State father occupation and that of others in the family *Inquire into condition of any former* occupants of the house and any present occupant not of the family Inquire into condition of others in the house who have contagious skin diseases such as scabies, impetigo, ringworm, pediculosis, also whether there are animals, such as cats and dogs, and their condition.

Do any of the child' playmates have contagious skin diseases such as impetigo, scabies and ringworm

Inquire as to hereditary and familial diseases; e.g. adenoma sebaceum, von Recklinghausen disease epidermolysis bullosa hereditaria, etc., and other conditions that may be present in members of the family

2 PAST HISTORY
A Birth At term or premature, character of delivery condition of patient immediately after birth, birth weight.
B Health during infancy Fever convulsions, cyanosis, eruptions (type, character distribution, treatment) snuffles, desquamation, hemorrhages, etc
C Development Weight gain, age of holding up head, sitting up alone, talking; time of appearance of first tooth, age full set (20 in number) beginning of school and progress general intelligence of child associates and attitude of child toward other children.
D. Feeding Breast or artificial, duration and intervals of artificial feeding, present diet before onset and after onset of *present illness*. (Record feedings separately after Roman numerals I, II, III, etc., one numeral for each feeding change.) Inquire regarding candy cake, chocolate, ice cream idiosyncrasies, likes and dislikes of particular foods aversions to particular foods, and eating between meals.
E. Personal habits Daily routine, habit of sleep with whom, etc. Condition of bedroom, animals in house (cat, dog) type or types of exercise, constipation and kinds of laxatives used.
F Diseases. Make positive statements and give age as to diphtheria, scarlet fever measles, pertussis, German measles, roseola infantum, varicella, etc. Give date and age for any *other illnesses and inquire as to cardiac,* respiratory gastrointestinal and genitourinary system.
G Prophylaxis T.A.T vaccination, typhoid fever Schick test, Dick test, poliomyelitis, etc. triple immunologic injections, booster doses (give dates)

3 PRESENT ILLNESS (DERMATOSIS)
Complaint in parent s, patient's, or relative own words, summarizing when necessary Cause of rash, if it is possible to elicit it.
Onset. Date and character (month, day year) *Distribution*. Where did rash first start and which areas of the skin were involved subsequently (Describe as symmetrical, asymmetrical; give general topography etc.) Duration. *Course* Evolution as completely as possible especially as to changes in appearance and signs and symptoms with date. State whether condition better or worse at present.
Symptoms State the most annoying symptoms of which patient now complains. State objective and, when possible, subjective *symptoms* as completely as possible. (When given under Onset and Course, these need not be repeated.)
Treatment From beginning of eruption to present time. Detail types of therapy in chronologic order including the number of treatments obtained by means of roentgen therapy physical therapy and their result. Idiosyncrasies and untoward reactions to drugs (e.g., sulfonamides, penicillin, white precipitate ointment, etc.) and side effects should be noted in detail.

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responsibility on the child? Is the child over fearful aggressive, or is his behavior average for his age? Does the child appear to have taken balanced steps in the psychologic development of habits and activities or is there overt or suggested evidence that he struggles, with symptom production, against his growth? The physician, in his interview with the parent should try to decide whether *the mother is in* need of psychologic assistance in rearing her child. It is the impression of the writer that while a psychologic basis *for dermatoses is not* nearly as frequent a finding as it is in later life and especially among adults, there is nevertheless a close *relationship between the skin and* the psyche in children which has thus far been given less attention by the average clinician *than it deserves.*

PHYSICAL EXAMINATION

The pediatrician *who is successful with children* aims to utilize every psychologic trick at his disposal in order to retain the good will of his patient. If time permits, a few moments preceding the physical examination should be devoted to an attempt to cultivate this good will It is not possible to set down any specific *rules for developing friendship in the course of* a brief interview However pediatricians through experience, have learned to adopt different methods of overcoming fear and apprehension depending upon the type of child and the time available Sometimes the use of a toy sometimes a mere handshake and a little talk*ing to the child pave the way to that confidence* and good will that must be sought for the physical examination However it must be admitted that in spite of all the little maneuvers at the pediatrician's command some children will refuse to cooperate and, because of deep apprehension, will not be cajoled into an examination. Under such circumstances further attempts to cultivate good will are useless and the examiner should then proceed with the routine examination in a stern manner despite the patient's protest. Perhaps it is because of *these difficulties that some general dermatologists* are not particularly anxious to examine and treat infants and children It is here that the pediatrician and general practitioner who treat children and understand their whims and fancies, can be of real service in *this special* field of practice.

The general routine physical examination of infants and children, from a dermatologic aspect is performed much in the same manner as that of adults. Routinely in pediatric practice the order of examination consists of in*spection palpation* auscultation and percussion. Examination of mouth, ears and nose and *taking of the temperature should be left* as final procedures, as should all special laboratory examinations and diagnostic procedures entailing the use of instruments of precision. These special examinations, understandably tend to upset the infant. Crying may distort the clinical picture of a rash and interfere *with further examination.*

The hands of the examiner should be warm and never placed on the skin of his patient when cold. It is a rule to conduct the physical examination of all infants and children with the patient completely undressed Timidity and shyness in older girls and boys particularly *about the time of puberty and during adolescence*, can be overcome by having the patient properly draped The child's mother (father in the case of older boys) a close relative or the office nurse should be present also during the examination. *It is a good plan never to take* the patient's word or that of the mother that there is nothing to be seen on the usually covered parts of the body The examiner should see for himself that the skin of the entire body is free from a rash, since otherwise many significant lesions are often overlooked

It is important that adequate light be provided during the day When it is necessary to examine patients at night, satisfactory artificial light should be used Because shadows may interfere with the proper interpretation of skin disorders, they *should as far as possible* be avoided

The examining room should be reasonably comfortable. A uniform temperature of approximately 7[illegible] F that can be lowered or raised is satisfactory *under ordinary conditions*. Nothing annoys a patient more than to be examined stripped in a poorly ventilated room especially during hot weather or to be

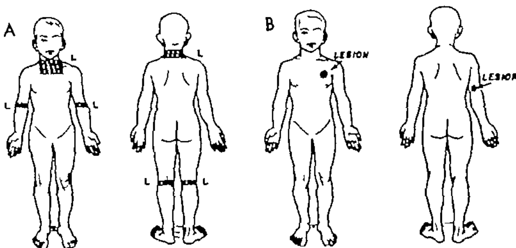


Fig. 3.—Two of the author' records showing use of anatomic charts to provide a permanent record of the site and distribution of lesions and facilitate evaluation of progress and results of therapy In A, the lesions are marked "L to denote lichenification. In B it is easy to see that the lesions are circinate.

undressed in a cold room during cold weather In children, exposure of the body to cold frequently causes goose pimples, which may alter the physical character of a rash.

Recording the lesions on anatomic charts (Fig. 3) serves to indicate for easy reference in the future at once the site and distribution of the lesions. The type of lesion can be recorded also, using the following abbreviations

Primary lesions M—macule, P—papule, N—nodule, T—tumor W—wheal V—vesicle, B—bulla, Pu—pustule.

Secondary lesions S—scale, Ex—excoriation, F—fissure, C—crust, U—ulcer Sc—scar

Other designations: Pl—plaque, L—Lichenification, Bu—burrow Pe—pediculi, O—ovum, In—infiltration, Id—induration, E—erythema, Oz—oozing, H—hyperpigmentation, De—depigmentation.

HISTORY TAKING

A carefully planned history taking into account the patient' past and present life, has its greatest importance when the clinician is dealing with an unusual skin eruption, especially when the lesions are ill-defined or lack the clear characteristics of the disease. Many an obscure drug eruption has been identified on testimony that the patient has taken or is taking medication containing phenolphthalein, a bromide or an iodide, often in the form of a proprietary remedy

There is much to be said, therefore, in favor of taking a complete history when a patient presents himself for advice and treatment of even a localized skin eruption. It serves several additional purposes. Parent and clinician have an opportunity for personal contact; they get to know one another Older and younger child alike come to realize the friendly attitudes involved in the conference and thus their natural apprehension may be dispelled.

It also serves to familiarize the examiner with the temperament and personalities of the child's parents. Further the clinician can observe the general reaction of the child in the parent-child relationship. He can note whether the child is well behaved, high strung and nervous, hyperirritable, shy aggressive, unusually timid and retiring, wide awake, disobedient, destructive, fretful, or well composed and

good natured. Such observations giving a general idea of the child's make-up may shed considerable light upon the nature of the dermatosis.

An alert mother with a keen insight into her child's habits, can be of considerable help to the dermatologist in discovering the underlying causes of many of the skin disorders prevalent in children. In this respect, she can be of greater aid in helping to solve the mystery of an obscure eruption than the physician himself when he cannot depend upon what he actually sees at the time of the examination. The mother's story will often serve to discover the cause for example her telling of close contact with pets such as kittens and pups, or with playmates infected with ringworm Or she may tell of using a popular proprietary ointment on her child's skin upon the friendly advice of a neighbor These are a few of the many factors which are commonly overlooked in obtaining a history from parents, but which are frequently important to the dermatologist in diagnosis of bizarre and difficult dermatoses.

An unusually high strung and ill behaved child may so disturb the equilibrium of an office that a careful and routine examination is impossible Under such circumstances it is important to interrogate the mother alone However children of school age are in the writer's experience keen observers reliable as to the events in the course of the evolution of a skin disorder and in most instances they can be depended upon to relate minute details with clarity

Family History

Many of the dermatoses seen in children are familial others are inherited The physician should question parents as to the presence of tuberculosis, syphilis, diabetes epilepsy idiocy rheumatic fever and malignancy in members of the family—both immediate and remote—for those diseases may have some bearing upon the dermatologic condition for which the patient seeks advice Inquiry should be made regarding hay fever asthma urticaria migraine angioneurotic edema, vasomotor rhinitis, etc., the occurring of one or more of which will help to substantiate a diagnosis of allergic disturbance such as atopic dermatitis.

Heredity plays considerable importance in many of the dermatoses seen by the pediatric dermatologist Among diseases that may be traced to similar conditions in parents and grandparents are congenital defects such as thyroglossal cysts, branchial cysts and fistulas, absence of the pectoral muscle and congenital cataract Monilethrix (beaded hairs) a condition in which a thickening and a thinning of the hair shaft occurs, is another example of a minor hereditable ectodermal defect accompanied by keratosis follicularis. Hydroa vacciniforme characterized by lesions on the dorsa of the hands and on the face from exposure to the sun is an example of a recessive hereditary disease Usually the parents of these children are normal and only one out of four children is affected Xeroderma pigmentosa is another hereditary affection seen in children The simple type of epidermolysis bullosa is a dominant hereditary disease while the severe type is recessive Other hereditable minor ectodermal defects include such conditions as scanty hair or absence of hair defective teeth especially defective in the enamel, and the various dystrophies. In the majority of patients seen with ectodermal defects, most of the ectodermal structures may be involved for example, teeth most of the glands, both sebaceous and sweat glands, and nails. Hereditary lymphedema known as Milroy's disease is another example of an hereditary disease and still other examples are to be found in nevi von Recklinghausen's disease adenoma sebaceum angiomatosis hereditaria hemorrhagica (Rendu-Osler Weber's disease) Many diseases of the blood and blood forming organs are hereditary in nature and leave their marks upon the dermal network The following disturbances of the skin seem to be conditioned by hereditary factors pigment anomalies, von Recklinghausen's disease allergic manifestations, urticaria angioneurotic edema certain infantile eczemas, epidermolysis bullosa albinism xeroderma pigmentosum syringoma adenoma sebaceum canities, ichthyosis monilethrix ectodermal defect and skin cancer Eller points out that in certain instances his staff was able to discover other members of the family afflicted with the same

conditions or able to obtain a history in previous generations of the family. Frequently however there is no such history.

Personal History

The personal history should include the *name*, *age* and *sex* of the patient. The parents should be questioned regarding the *type of delivery*, whether the birth was natural, spontaneous or prolonged, and whether forceps were used. The facts concerning the type of analgesia employed in the mother and the condition of the newborn infant following delivery may help in discovering the true state of the child's health and his possible future development. While many of these data may seem farfetched and insignificant insofar as the skin condition is concerned, they sometimes become important links in reaching a conclusion when dermatoses are bizarre and not readily diagnosed.

Notation as to the infant's *weight and height* at birth and subsequent periods such as at the end of 6 months, 1 year, 2 years, 6 years, etc., may throw considerable light upon the nutritional status. A child who fails to grow normally may show early signs of hypothyroidism. Thus, unless biologically of short stature because of his parents, failure to grow normally may call for a roentgen examination of the epiphyseal centers to determine whether ossification of the bones is proceeding normally. Certainly stunted growth in an older child calls for a basal metabolism test or a protein-bound iodine test. The normal infant at the breast or on bottle who is thriving doubles his birth weight approximately at the end of five or six months and triples it by the end of the first year. Approximately, with some exceptions, infants should gain 4–5 oz. per week during the first six months after birth, and 2–3 oz. per week during the second half year.

It is advantageous to know whether the patient was a full-term baby, immature or premature since, in some instances at least, prematurity and immaturity may have some bearing upon diseases in the newborn period.

A history of cyanosis at the time of or soon after birth may indicate congenital heart disease, imperfect closure of the foramen ovale or congenital atelectasis. Convulsions soon after birth may mean intracranial hemorrhage due to a tentorial tear at delivery. A history of snuffles, particularly with a blood-tinged discharge from the nose, with desquamation of the palms and soles may suggest the presence of congenital syphilis. So, too, failure to gain weight or particularly loss in weight in a breast or bottle fed infant soon after birth may mean the presence of a syphilitic infection. The feeding habits of infants and their reaction to certain foods often give the examiner an idea of possible allergic disturbance. Inquiry should be made whether the infant was breast fed or bottle-fed and for what period of time such feeding was continued. If it was weaned from the breast, at what period and why? It is important to get some idea whether the infant gained properly and if frequent changes in the milk formulas occurred. Frequent changes of foods at an early age may indicate allergic disease. Did the infant manifest any aversion to particular foods? If so, which ones? Was the baby satisfied after his customary breast or bottle feeding? Was colic present? If so, after what types of foods? At what time during infancy was orange juice started? Cod liver oil or vitamin D? Were there any abnormal reactions to such vitamins? Did a rash follow the giving of orange juice, vitamins? Did colic or diarrhea follow the usual foods? When was a mixed diet instituted, cereals, eggs, etc., and with *what effect upon the skin*, and upon the child in general? Errors in feeding frequently explain malnourished states, scurvy (rare), tetany, rickets (rare) and intestinal disturbances, all of which may have some bearing upon the general physical health and the skin in later life.

Frequently, too, it may become necessary to know something about the child's earlier mental state and development because some of the skin disturbances in later life, such, for example, as adenoma sebaceum, are associated with retarded mentality. The normal infant smiles at about five weeks old, holds his head erect at the age of two months, grasps objects about the fourth month, sits with some support at the age of four or five months, stands at about ten or eleven months, walks a few steps without help soon afterward and walks unsupported at about one year.

In adenoma sebaceum, tuberous sclerosis

(epiloia) is frequently present. Some such patients are subject to epileptic seizures. Butterworth and Wilson have pointed out that frequently adenoma sebaceum makes its appearance in the first decade of life. Hemangiomas of the brain are often found associated with vascular nevi of the face. The nervous symptoms usually start as early as the first few months of life and are characterized by Jacksonian fits, vertigo tremor disturbances of gait, hemiplegias. The identification of idiocy with asymmetry of the face with calcification of the brain lesions verified by roentgenograms, has been reported.

The closure of the fontanel serves to indicate the condition of the osseous system and also whether there is any intracranial disturbance present. The posterior fontanel closes normally between the second and fourth month the anterior fontanel between the tenth and fourteenth months Delayed closure may mean rickets or brain tumor although often the anterior fontanel does not close completely until the eighteenth month. Premature closure of the fontanel may mean cretinism or idiocy (microcephalic head)

The normal infant can usually say a few words at the end of a year The first tooth generally appears at the age of six or seven months and at the end of the first year there should be six teeth or more. A full grown infant should have 20 teeth. The bowel function should be under control at from four to six months and the act of urination controlled by the time the child reaches two and a half years. Such are the normal indices of child growth that should be kept in mind as a comparative yardstick

The child's personal habits may have considerable significance for the dermatologic condition Inhalants from wool cotton silk, etc as well as various contactants may be responsible for an atopic dermatitis. So too the ingestion of allergens in foods, milk, egg, wheat, etc., may account for infantile eczema. Chocolate and closely related foods (cola nut in soft drinks) are bad acting allergens in acne Close contact with cats and dogs may be the transmitting factor in the etiology of urticaria papulosa and in animal ringworm of the scalp and body Many proprietary medicaments used for the relief of constipation contain phenolphthalein and their continued use may be the cause of a fixed drug eruption.

PREVIOUS DISEASES.—It is advantageous to know the infectious and childhood diseases that the patient has had. All the exanthemata are generally followed by a lasting permanent immunity measles, German measles, scarlet fever chickenpox roseola infantum and meningitis confer a permanent immunity in patients, although occasional second attacks of scarlet fever have been reported The evidence of a good vaccination scar should be looked for and noted Parents should be interrogated as to past illnesses of their children, such as rickets, intestinal disorders, tonsillitis pneumonia and whether these were accompanied by any dermatologic manifestations. While such data are not necessary for the diagnosis of a simple dermatosis, such as an impetigo contagiosa it is useful positively as corroborative evidence and negatively in the elimination of certain dermatoses when the clinical picture is indefinite and diagnosis difficult.

The Present Illness (Cutaneous Eruption)

Having assembled by questioning of parent relative, or patient (in the case of older children) preliminary data that may have some bearing upon the skin disease, the clinician is now ready to direct his attention to the disorder The description whenever possible is best obtained from the patient since as has already been stated no one can describe a condition better than the sufferer Usually older children will be able to tell with accuracy when the rash *first appeared to describe the character of the* eruption and any subjective symptoms such as itching burning or discomfort In the case of infants and younger children mothers usually will notice any rash or skin disturbance as soon as it appears. Indeed it is the exceptional mother who fails to scrutinize the skin of her infant either during the daily bath or when preparing the child for bed Nevertheless, in some instances obscure answers will be given.

Sometimes there are no specific symptoms and the patient will state that the presence of a rash is the only cause that directed him to the doctor's office *In the case of boys and girls*

about the time of puberty acne lesions on face and chest will be sufficient reason for their seeking medical counsel. Indeed, in view of the cosmetic effect the lesions may create if long continued without treatment and also because of the shyness and inferiority complex acne can produce, their concern is justified. However most mothers will seek medical advice for rashes because they are concerned to know the nature of the eruption, whether it is contagious and whether it will leave any scar marks after it has involuted.

The question of scarring is one particularly common with mothers of infants afflicted with atopic dermatitis. The answer of course will depend upon the nature of the dermatosis. From histopathologic viewpoint it will depend upon whether the dermatosis has involved the corium or is limited to the epidermis. Thus, for example, impetiginous lesions are confined to the stratum corneum, whereas some pyodermas invade the epidermis. In both instances healing occurs by regeneration of tissue. On the other hand, deep-seated impetigo, so-called ecthyma, involves the uppermost portion of the corium and healing takes place by repair of tissue, which means a scar. One of the reasons the writer has insisted upon splinting the elbows of infants in his management of atopic dermatitis (infantile eczema) is to prevent damage to the epidermis and in some instances the corium by the patient's digging and scratching. Superficial abrasions of the epidermis will heal without scars but, when the inflicted injury reaches as far as the corium, scar tissue will result. Obviously chronic lesions such as those due to lupus vulgaris, lupus erythematosus and many congenital defects, often result in permanent damage to the skin. A question that frequently arises is whether the treatment of nevi, such as cavernous angioma on the face and other regions of the body will leave scars. The physician who attempts to treat such lesions by means of sclerosing agents or by other methods such as dry ice or radium, should make it perfectly clear that a resultant scar from such treatment is inevitable, but that if nature herself tends to "cure" the condition, scar formation may result that is often more unsightly than that due to treatment. Such necessary statements are preferably made in the presence of a witness, such as the office nurse.

Whenever possible a direct statement should be obtained as to when the skin eruption first was noticed and its character. Distribution and color are also important diagnostic aids and should be inquired into. An effort should also be made to follow the course of the eruption from its onset. The nature of topical medication used can be obtained by inquiry from the pharmacist. In the case of roentgen therapy inquiry as to the exact number and kind of treatments is advisable.

Frequently too, patient or parent can assist in diagnosis and in tracing the etiology by enumerating substances with which the child has been in contact. For instance a dermatitis venenata involving the circumoral area may be due to a tooth paste or to the sucking of an orange rind colored with an aniline dye. Toys, crayons, paints, varnish or plastics upon toilet seats, pets and nylon may all produce various degrees of dermatitis due to colorings and materials which come in contact with different parts of the skin and to which the skin reacts as to either a primary irritant or a sensitizer. The exact allergenic agent or contactant may be isolated only after a great deal of questioning. Then corroborative evidence must be secured by patch testing.

When the physical examination and taking of the history are completed, they form the basis for the diagnosis and treatment and the prognosis. The record should be completed with care that nothing is omitted that could cause uncertainty or reliance upon memory in the future.

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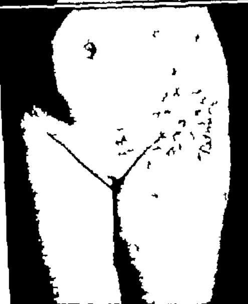




Fig. 4 (top left).—Dermatitis venenata, in 10-year-old girl, produced by use of proprietary remedy advised by neighbors and of Whitfield' ointment advised by corner pharmacist following erroneous diagnosis of athlete foot.

Fig. 5 (top right).—Acute contact dermatitis of 6 weeks duration in girl 13 years of age. Acute erythematous exudative plaque on antecubital region of right upper extremity. Crust formation. Caused by topical ointment containing benzocaine and metacresol.

Fig. 6 (bottom left).—Dermatitis venenata following use of proprietary preparation containing camphor and phenol in girl, 4 years of age. The perpetual bed-wetting of the child had resulted in a diaper rash. Application of the proprietary remedy resulted in superimposed inflammatory reaction.

Fig. 7 (bottom right).—Dermatitis venenata in girl, 16 years of age. Note marked erythema with vesiculation and bullae, exudation and crust formation. This violent inflammatory reaction occurred within 4 hours of use of a prescription containing 10 per cent ammoniated mercury and 5 per cent salicylic acid in a cold cream-hydrophilic petrolatum base, prescribed for ringworm contracted from kitten.

5

Principles of Dermato-therapeutic Management

IN THE MANAGEMENT of dermatoses, it is important to remember that the skin is an organ with physiologic responsibility and capable of immunobiologic response. This proper concept is of *basic importance in all aspects of management* including the choice and use of remedies, the preparation of the skin to receive the remedy the maintenance of the patient's nutritional status, and the management of *pruritus.*

THE SKIN AS AN ORGAN

The pitfalls that so commonly beset the physician when he orders topical remedies occur because of misconceptions regarding the skin and its functions. Only too frequently for instance, he disregards the possibility that the skin's ailment may be a sign of internal disorder He looks upon the dermal network as a mere covering for the body and the structures within, forgetting that the skin itself is a structure endowed with physiologic responsibility not unlike that of the kidneys lungs and other vital organs. Thus he may regard dermatoses as simple local disturbances that may be improved by means of a simple lotion or ointment. This reasoning is wide of the truth For while it is true that many minor skin disorders will improve with proper topical therapy it is also true that many of the skin manifestations seen in daily practice are due to constitutional disturbances *Psoriasis, seborrheic dermatitis,* xanthomatoses, lipoid disorders, tuberculosis, syphilis and the avitaminoses are only a few examples of constitutional disease which the skin shares through local manifestations. Upon this topic, the author fully agrees with Caro, who writes "*One should always keep in mind that he is* treating a patient with a cutaneous disorder rather than merely treating a cutaneous disease. *All of us need constant reminding* that the skin is often a window to internal disease "

A common error in prescribing topical agents in the treatment of infants and children is the ignoring of the fact that the skin being capable of inherent immunologic biologic response reacts to the baneful effects of bacteria, fungi and external irritants as do the vascular system and other organs. In the newborn infant of course the immunologic mechanism of the skin is generally but slightly developed and may even be entirely absent However the resistance of the skin improves as the child grows older Accordingly topical remedies when ordered for skin diseases in children, are often prescribed out of all proportion to the indications and without consideration of the fact that,

phytosis, this ointment must be reduced to at least one fourth the official strength when used for treating fungous infections in young children. Again, white precipitate ointment U.S.P in full strength (5%) frequently acts as a primary irritant when used upon the skin of infants and younger children. Accordingly the writer never prescribes ammoniated mercury ointment upon the glabrous skin in concentration stronger than 3 per cent.

Knowing the Composition

As stated earlier the physician should know thoroughly the remedial agents he prescribes, especially since the comfortable truism is no longer tenable that dermatoses will improve if let alone long enough, with perhaps a placebo by the way to still the fears of fussy parents. The promptness with which scabetic lesions yield to sulfur and the balsamic resins or benzyl benzoate, the wonder-working of antibiotics upon impetigo contagiosa, the rapid improvement of seborrheic dermatitis under the properly prescribed keratolytic or parasiticidal remedy the good results from vitamin D (calciferol, Drisdol) and more recently the isonicotinic acid derivatives in the treatment of lupus vulgaris—these happy results should rout any therapeutic pessimism that still lingers among the profession.

On this score it is an interesting fact that fewer than 1 per cent of all physicians possess a *United States Pharmacopoeia*. Perhaps the official text is not really a necessity for the average practicing physician. However many of the remedies contained either in the *U.S.P* or *The National Formulary* are valuable to the dermatologist and to the internist and deserve to be known. Time spent familiarizing oneself with the official remedies would show that many proprietary preparations contain official remedies or are similar remedies under other names. Still each year without diminution, the flood of new ointments and creams continues to beat against the door of the physician. Obviously if the physician were not receptive to this flood, the mail would soon cease to acquaint him with the host of newer remedies. That he is receptive signifies neglect in training that has become defect in practice. Here is involved no new useful remedy of definite advantage above what is already known In the preponderant number of instances the recommended stranger is but an old acquaintance in disguise. This failure of recognition does little honor to professional knowledge. But, unhappily the business does not end there. Economically it is highly wasteful. The patient, upon whom as end man the swollen costs are discharged, pays perhaps three or four times the reasonable value of what he receives. So it is that one of the less admirable results of modern therapeutics is a competitive scramble among manufacturers for the trade in proprietary preparations. In the melee of this competition, the suave appeal of advertising copy attacks the skill and intelligence of the physician and, far from being assisted, his mind is actually confused. Far too frequently the physician finds, with experience that new proprietaries fail to make good on the claims he has been led to expect from them. Accordingly one often fares better by returning to an old-fashioned drug which has proved its efficacy

Obviously the physician will often be faced with circumstances that call for quick resort to a proprietary drug, since the search for official products is sometimes impractical. Here, the latest edition of *New and Nonofficial Drugs* (The Council on Drugs, American Medical Association [Philadelphia J. B. Lippincott Company]) should serve as a ready guide. Nevertheless, the fundamental problem of better therapeutics remains. As a long-term problem, it will continue until a better approach is made to the subject among the undergraduates in our medical schools. When our medical schools become therapeutically minded, the profession will be less tolerant of advice from commercially interested sources and an increased self-respect and efficiency will come to the profession, and an added measure of service to the public

Non-official, rare, and expensive drugs and preparations should not be prescribed unless the more economical official ones have failed in their therapeutic purpose. The following list of some of the more commonly ordered drugs is given to illustrat the trade (proprietary) name and their official titles or equivalents.

The patent rights of many of these proprietary drugs have expired.

when used in concentrated strength they may interfere with or even suppress the immunobiologic functioning of the skin Many of the simpler skin disorders are often worsened or traumatized through the indiscreet use of topical remedies or through the patient's self medication Frequently mothers hear of the excellence of a proprietary ointment or preparation perhaps by the endorsement of the neighborhood pharmacist Seeing infants and children on whom such preparations have been used with a resulting contact dermatitis is the everyday experience of all dermatologists.

Hypersensitivity to a particular agent also may be responsible for a therapeutic dermatitis (Figs. 4 5 6 7) Some of the more likely offenders include phenol menthol Nupercaine Butyn and sulfonamides Sulfonamides, which constitute one of the largest groups, should not be used for more than five to seven days on the skin or at best should not be used as topical remedies. Because organic mercurial compounds lead all the other cutaneous drugs in producing positive patch tests, all such preparations should bear a warning on the label indicating the presence of a sensitizer It is a well known fact that in dermatologic practice often the remedy is worse than the disease

THE REMEDY

Importance of Simplicity

Simplicity is the rule to insure success in all dermatologic therapeutics. The polypharmaceutical containing at least a half-dozen remedies and prescribed upon a hit-or-miss philosophy has no place in modern scientific therapeutics. Every remedy or drug ordered should be prescribed with a clear-cut indication for its use. The pediatrician who treats skin disorders in children should always ask himself before writing a prescription, "Will this remedy I am about to order do more harm to the dermatosis than if I allow the condition to remain untreated?" By such self-questioning needless remedies can be avoided and unnecessary harms prevented.

On the other hand precaution must not be carried to the point of extreme apprehension Here as elsewhere good sense dictates the golden mean Too the pediatrician should familiarize himself with everything known about a new drug or chemical before it is prescribed its therapeutic properties, the experience of others with it whether it may act as an irritant or a sensitizer its side effects and untoward reactions, the best method of prescription and also in a general way something about its more important incompatabilities In the latter respect a professional pharmacist can be of assistance to the physician. Every new remedy ordered for the first time is in a certain sense an experiment, not unlike the milk formula prescribed by a pediatrician when he is called upon to see a newborn infant who is to be artificially fed Furthermore, one must feel his way along not only with newer drugs prescribed for the first time but with old remedies too much in the same manner as the pediatrician does in increasing or changing the milk formula. It is a standing rule in all dermatologic practice that topical remedies should be prescribed in mild concentration at first and their strength increased gradually when indicated. In addition, at first their use should be restricted to small areas of the skin that are to be treated This cautious method of proceeding is absolutely necessary for the best interest of the patient in light of the old adage "What is one child's food is another child's poison

The necessity for exercising caution in prescribing topical remedies for infants and younger children for the first time cannot be overemphasized For example two remedies commonly abused by the medical profession as a whole are Whitfield's ointment and ammoniated mercury ointment The former preparation is frequently prescribed in the management of children with athlete's foot yet the ointment of benzoic and salicylic acid a powerful keratolytic, should never be used in full strength at the very beginning of treatment even for adults As explained in detail in the discussion of dermato-

as a hydrophilic ointment base (Hydrophilic Petrolatum U.S.P.) instead of petrolatum, is indicated in order to carry the active ingredient deeper into the skin through the pilosebaceous ducts. Similarly the treatment of tinea capitis calls for ointment bases and such vehicles as penetrate into the hair follicles.

Pastes are particularly useful and are indicated where residual exudates are to be absorbed. They fill a real need in that phase of any dermatosis at which the *acute inflammatory* reaction of the skin has subsided and before the chronic stage, when more potent remedies are indicated.

Powders too are useful for their cooling ef*fects and are indicated to absorb* exudates and fluid.

Lotions (shake lotions) are indicated for their cooling effect and to absorb exudate. They are particularly valuable during periods of *hot* and *inclement* weather when ointments are disadvantageous.

Emulsions serve the purpose of adding oil and lubricating a skin that is dry and lichenified.

Creams are prescribed for their cooling effect. They have the advantage over ointment of being non-tacky and greaseless.

Colloidal baths are employed for their antipruritic and emollient effects upon an acutely inflamed skin.

Quantity

The quantity of medicaments to order is a matter that frequently perplexes young physicians.

The answer in the case of ointment, cream, paste, emulsion, lotion or powder will depend largely upon the extent of the eruption but also upon such factors as the frequency of application and the intervals at which revisits are to be made to the office. Generally infants and children are seen once weekly for acute dermatoses and every second or third week during the subacute and chronic stages. However there are many exceptions and no hard and fast statement can be made. This is particularly the case when treating atopic dermatitis. Nevertheless, it is important for the physician to have some idea as to the quantity of the medication necessary and to prescribe a definite amount for use over a fixed period of time. A guide to quantity in prescribing appears in Table 8.

TABLE 8.—Guide to Quantity in Prescribing

	First 3 Years	3-12 Years	12 Years and over
Ointments			
For face	1 oz.	2-3 oz.	3-4 oz.
For hands (depending on whether applied freely or rubbed in)	1-2 oz.	1-3 oz.	2-3 oz.
For scalp	2 oz.	2-3 oz.	3-4 oz.
For body or both arms and legs if eruption is patchy	1 oz.	2 oz.	4 oz.
For body and extremities if eruption is general. Larger amounts are for simple creams only	2-4 oz.	4-8 oz.	8-16 oz.
For three general applications of thin coat when all rubbed in	1-2 oz.	2-3 oz.	4-6 oz.
For groins	1 oz.	1 oz.	1 oz.
For anus and genitalia	1 oz.	1 oz.	1 oz.
Lotions			
For face	2 oz.	2-3 oz.	4 oz.
For face and back	2 oz.	4 oz.	8 oz.
For scattered patches, trunk and extremities	2 oz.	3-4 oz.	6-8 oz.
For hands, frequent use	2 oz.	3 oz.	6 oz.
For body and extremities as in bath lotions	6 oz.	8 oz.	16 oz.
For scalp	4 oz.	4-8 oz.	8-16 oz.
Powders for most purposes	2 oz.	oz.	2 oz.
Paint (Castellani)	1 oz.	1 oz.	1 oz.
Medication (liquid) by mouth			
Dose: 1-5 drops	½ oz.	1 oz.	2 oz.
15 drops to 1 teaspoon	3 oz.	3 oz.	4-6 oz.
2 teaspoonfuls to 1 tablespoonful	4 oz.	4-8 oz.	8-16 oz.
Solids			
Dose: 1 capsule, tablet or pill, t.i.d.	24	24	50
2 capsules, tablets or pills, t.i.d.	—	50	100-150
3 capsules, tablets or pills, t.i.d.	—	100	300

NOTE. The swallowing reflex in children is seldom developed before 5 yrs. of age, although some much younger children can be taught to swallow pills, capsules and tablets.

The determination of the proper quantity required for any given dermatosis avoids waste and unnecessary expense for the patient and embarrassment for the physician. Further exactitude in prescribing medicaments increases the

Proprietary Name	Non Proprietary Name or Equivalent
Phenacetin	Acetophenetidin U.S.P
Aspirin	*Acetylsalicylic Acid, U.S.P*
Veronal	Barbital, U.S.P
Urotropin	
Formin	Methenamine, U.S.P
Luminal	*Phenobarbital* U.S.P
Aristol	Thymol Iodide, N.F
Argyrol	*Mild Silver Protein, U.S.P*
Protargol	Strong Protein Silver N.F
Vioform	*Iodochlorohydroxyquinoline*, N.F
Aquaphor	Hydrophilic Petrolatum, U.S.P
Qualatum	Hydrophilic Petrolatum, U.S.P
Benzyl Benzoate Emulsions	Benzyl Benzoate Lotion U.S.P
Benzocaine Anesthesin	Ethyl Aminobenzoate U.S.P

Choosing the Proper Remedy

Obviously the choice of a proper remedy depends *upon the diagnosis. In some dermatoses*—for example in atopic dermatitis or in dermatitis *venenata (rhus, sumac, etc.) characterized* by edema of the epidermis and corium—the *first step toward restoration of a sick skin* consists of ridding the tissues of their fluid Fundamentally drainage of edematous *fluid is* indicated wherever it is present, irrespective of the nature of the dermatosis, and *it is* to be accomplished by wet dressings (Chapter 6) which *should be applied continuously until the skin is* edema free. Briefly this procedure includes the use of several layers of linen or the use of a Turkish towel saturated with a suitable solution and applied to the area of the skin that is being treated for a period of 24–48 hours. When the signs of acute inflammation have subsided and vesiculation, redness, swelling of the part and local heat are no longer present, the condition may be regarded as having reached the subacute stage. *The wet dressings when applied* should not be covered by an impervious material since *the object sought is the removal of* fluid from the skin by evaporation. Wet dressings *should not be allowed to dry nor should* they be too bulky and they should be changed frequently *Wet dressings are preferably* used cool or cold and on this account should not cover too large an area of the skin lest they chill the child.

The subacute phase of any dermatitis requires the use *of soothing* remedies, which perhaps, should be incorporated in a paste rather *than an ointment* because pastes will absorb any residual fluid still present in the skin, as a *sponge absorbs water* while ointments will not.

The chronic phase of an inflammatory dermatosis calls for remedies that are stimulating *to the skin and that by their action will call the* immunologic response into play Thus, for example the third stage of atopic dermatitis requires such stimulating remedies as the tars, salicylic acid, or perhaps a mild dose of roentgen rays. Nevertheless all of these agents are definitely contraindicated during the earlier stages of this cutaneous disturbance

Choosing the Proper Base or Vehicle

After the proper *remedy has been chosen* the next step is to determine its proper base or *vehicle. This second choice will depend entirely* on what the clinician aims to accomplish in *treatment that is, whether he wants the remedy* to act on the superficial layers of the skin or to penetrate more deeply *In the treatment of scabies,* for instance the *ointment* base should be *either benzoinated lard or petrolatum into* which the sulfur is incorporated since the Acarus scabiei and *the ova deposited by the female mite* are found in only the most superficial layers of *the epidermis. This reasoning holds true also* with regard to ointment bases that contain *germicidal remedies, such as ammoniated mercury* for the treatment of superficial infections *of the skin. In the treatment of impetigo contagiosa* in which the active lesions are located in the superficial layers *of the epidermis, generally* all that is required for the therapeutic effectiveness of the bactericidal remedy is the preliminary removal of the crust with soap and water and then application of the remedy On the other hand, in treating ecthyma, a condition in which the lesions involve the deeper structure (superficial area of the corium) the object sought is penetration Under such circumstances, one of the newer *wetting agents* such

as a hydrophilic ointment base (Hydrophilic Petrolatum U.S.P.) instead of petrolatum, is indicated in order to carry the active ingredient deeper into the skin through the pilosebaceous ducts. Similarly the treatment of tinea capitis calls for ointment bases and such vehicles as penetrate into the hair follicles.

Pastes are particularly useful and are indicated where residual exudates are to be absorbed. They fill a real need in that phase of any dermatosis at which the acute inflammatory reaction of the skin has subsided and before the chronic stage, when more potent remedies are indicated.

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TABLE 8.—Guide to Quantity in Prescribing

	Under 5 Years	5-12 Years	12 Years to Adult
Ointments			
For face	1 oz.	2-3 oz.	3-4 oz.
For hands (depending on whether applied freely or rubbed in)	1-2 oz.	1-3 oz.	2-3 oz.
For scalp	1 oz.	2-3 oz.	3-4 oz.
For body or both arms and legs if eruption is patchy	1 oz.	2 oz.	4 oz.
For body and extremities if eruption is general. Larger amounts are for simple creams only	2-4 oz.	4-8 oz.	8-16 oz.
For three general applications of thin ointment well rubbed in	1-2 oz.	2-3 oz.	4-6 oz.
For groins	1 oz.	1 oz.	1 oz.
For anus and genitalia	1 oz.	1 oz.	1 oz.
Lotions			
For face	2 oz.	2-3 oz.	4 oz.
For face and back	2 oz.	4 oz.	8 oz.
For scattered patches, trunk and extremities	2 oz.	3-4 oz.	6-8 oz.
For hands, frequent use	2 oz.	3 oz.	6 oz.
For body and extremities as in bath lotions	6 oz.	8 oz.	16 oz.
For scalp	4 oz.	4-8 oz.	8-16 oz.
Powders, for most purposes	2 oz.	2 oz.	2 oz.
Paint (Castellani)	1 oz.	1 oz.	1 oz.
Medications (liquid) by mouth			
Dose: 1-3 drops	½ oz.	1 oz.	2 oz.
15 drops to 1 teaspoon	3 oz.	3 oz.	4-6 oz.
2 teaspoonfuls to 1 tablespoonful	4 oz.	4-8 oz.	8-16 oz.
Solids			
Dose: 1 capsule, tablet or pill, t.i.d.	24	24	50
2 capsules, tablets or pills, t.i.d.	—	50	100-250
3 capsules, tablets or pills, t.i.d.	—	100	500

Note. The swallowing reflex in children is seldom developed before 5 yrs. of age, although some much younger children can be taught to swallow pills, capsules and tablets.

The determination of the proper quantity required for any given dermatosis avoids waste and unnecessary expense for the patient and embarrassment for the physician. Further exactitude in prescribing medicaments increases the

confidence of the patient who may doubt the ability of the physician who recklessly prescribes large amounts of drugs that are expensive, wasteful and unnecessary

Answers to the following questions are helpful in deciding the quantities of medicaments to order (1) Are the lesions restricted to a small area of the skin or do they cover large areas of the body? (2) Approximately how much of the preparation will be required for a single treatment? (3) How often will it be necessary to use the preparation? Before retiring? Every three or four hours? In the morning and at night? (4) Will it be necessary to see the patient again in a few days, a week or after several weeks?

Copies of prescriptions are frequently requested by patients, particularly those who reside in distant cities and who travel Too, some patients will require renewal of prescriptions for refills during extended holidays. Under certain conditions, for example when ordering local anesthetics such as benzocaine or a sulfonamide, the quantities prescribed are small and the medicament must not be used for long periods at a time. Accordingly it is important that prescriptions containing those drugs not be renewed without the physician's consent Many prescriptions should contain the order *Non Repetatur* which signifies that they are not to be renewed Today the pharmacist is cooperative and in most instances will not refill a prescription without the written order or verbal consent of the attending physician.

It is perhaps unnecessary to remind the physician to be as mindful of economy as is possible in ordering medication for children. Some of the endocrine products, intramuscular injections, vitamins and more recently the corticosteroids are prohibitively costly to many patients particularly among parents of the low income group Frequent changes of prescription should be avoided

Preparation of the Skin

The skin, as an organ of respiration under normal conditions continuously exchanges carbon dioxide and oxygen Physiologically the pH of the skin is slightly on the acid side—a feature spoken of as the "acid mantle. In treating dermatoses b topical applications it is desirable insofar as possible that the acid mantle of the skin be preserved This is important in order that the normal physiologic functions of the skin may be carried on. Accordingly topical remedies should be applied in thin layers, changed at relatively frequent intervals

Crusts, exudates and debris, the result of inflammatory processes, should be removed frequently by means of suitable bland emollients and detergents As will be seen later most sick skins tolerate the use of soap and water poorly and to meet this situation recently sulfonated oils and "wetting agents of one kind or another have been introduced into dermatology as substitutes for alkali soap Among the various emollients that might be mentioned are warm applications of olive oil expressed almond oil and peanut oil These serve as excellent cleansers of the skin that has been treated by various topical agents. Occasionally a small amount of petroleum benzin dissolved in olive oil or acetone and placed upon absorbent cotton or soft gauze may be used to remove crusted lesions satisfactorily Mineral oil is a mixture of aliphatic hydrocarbons. It is popular with many dermatologists as a cleansing agent for the skin but it has been found by others, including myself to irritate the skin of infants and children at times, causing folliculitis pruritus and erythema. I seldom therefore employ liquid petrolatum as a detergent. Instead I use the official cold cream (Rose Water Ointment U.S.P) without the oil of rose with a good detergent effect The rose oil is omitted because it often causes irritation.

In applying lotions it is a good plan to have the pharmacist dispense the preparation in a wide-mouthed bottle After the contents are thoroughly shaken a small amount should be poured into a receptacle and then applied to the lesions by means of a soft paint brush The common practice of pouring a lotion upon absorbent cotton is inefficient because the cotton absorbs the greater part of the lotion and yields an unequal distribution of that which remains on the skin.

It is generally believed that soap by reason of its alkalinity is injurious to a sick skin, although reports in the literature are somewhat contradictory as to whether the harmful effects are due to the alkaline pH or to the calcium and magnesium soaps that result from precipitation

with hard water or to the irritating free fatty acids that result from hydrolysis.

The physician should remain constantly aware of the need to maintain the general health of the child through proper nutrition. No treatment, no matter how effective from the dermatologic therapeutic point of view is justified if it endangers the patient's nutritional status and health. In an infant with atopic dermatitis, for instance strict curtailment of food could easily lead to impending acidosis and an appreciable loss of weight.

PHYSIOLOGIC REST AND RELIEF OF ITCHING

Rest is always important for the welfare of *infants* but particularly for infants suffering from pruritus. Sedatives are definitely indicated, therefore, whenever a dermatosis interferes with the infant's or child's rest and sleep but they should be of a mild nature that can be tolerated without upset to the child's gastrointestinal system and preferably not habit forming. One of the barbiturates, such as phenobarbital or chloral hydrate, is to be preferred. The dose of either drug should be *enough* to cause rest and sleep. I seldom prescribe less than 0.016 Gm. (¼ gr.) of phenobarbital sodium (soluble phenobarbital) for very young infants and frequently prescribe as much as 0.03 Gm. (½ gr.) for *somewhat older infants*, to be given every three or four hours to produce rest. Nor have I ever seen untoward effects from the use of barbiturates given in the manner described. I have also used as much as 0.32 Gm. (5 gr.) of chloral hydrate per day for infants without any harmful effects. Chloral hydrate has a low index of sensitivity and for this reason is a popular sedative with most dermatologists. Nevertheless, the soluble phenobarbital in syrup of orange is preferable, although the official elixir (Phenobarbital Elixir U.S.P.) containing 16 mg. (¼ gr.) per teaspoonful may be used instead. The small amount of alcohol contained in the elixir is not habit forming or harmful when given over a period of several days. The following prescriptions illustrate the manner in which such sedatives may be ordered

℞
Soluble Phenobarbital 0.78 Gm. (gr. XII)
Syrup of Orange 90.0 cc. (fluid oz. III)
Misce et fiat
Signa: One (1) teaspoonful in orange juice every 4 hours (for child 3 years)

℞
Chloral Hydrate 3.2 Gm. (gr. XLVIII)
Elixir Benadryl 45.0 cc. (fluid oz. I ss)
Syrup of Raspberry q.s. ad 90.0 cc. (fluid oz. III)
Misce et fiat
Signa: One (1) teaspoonful every 3 hours, or two (2) teaspoonfuls before bedtime (for child 5 years)

Generally narcotics belonging to the opium series, such as camphorated tincture of opium (paregoric) and codeine, should be avoided, since these remedies increase the pruritus and are not well tolerated by most infants and children. However this statement requires some modification since occasionally one must resort to this group of remedies when all other sedatives fail to bring rest and sleep.

Topical remedies also should be prescribed for the relief of itching. Among them, the colloidal starch bath and the oatmeal bath are valuable, since either serves to allay acute erythema and itching. Several commercial preparations of starch, such as Argo and Linit, are available in hydrolyzed form and do not require boiling before use. They need only to be mixed with water and stirred with a spoon or wooden stick until the mixture is milky white, when it may be added to the water of the bath. On the other hand, ordinary starch should be prepared by adding ¼ lb. of cornstarch to a quart of water transferring the mixture to a pot and heating to the accompaniment of constant stirring until the starch takes on the appearance of ground glass. After the paste has cooled, it may be applied to the skin. The infant is then given the customary bath, in which he may remain for from 5 to 10 minutes provided the room is sufficiently warm. After the bath, the skin should be patted gently with a soft towel or layers of soft gauze. Under no circumstances should it be rubbed. A colloidal bath may be given once or several times a day. To finish, a fine unscented talc may be used to dust the skin, but any talcum powder contain-

confidence of the patient, who may doubt the ability of the physician who recklessly prescribes large amounts of drugs that are expensive, wasteful and unnecessary.

Answers to the following questions are helpful in deciding the quantities of medicaments to order: (1) Are the lesions restricted to a small *area of the skin or do they cover large areas of* the body? (2) Approximately how much of the preparation will be required for a single treatment? (3) *How often will it be necessary to use* the preparation before returning? Every three or four hours? In the morning and at night? (4) *Will it be necessary to see the patient again in a* few days, a week, or after several weeks?

Copies of prescriptions are frequently re*quested by patients, particularly those who re*side in distant cities and who travel. Too, some patients will require renewal of prescriptions for *refills during extended holidays. Under certain* conditions, for example when ordering local anesthetics such as benzocaine or a sulfonamide, *the quantities prescribed are small and the medi*cament must not be used for long periods at a time. Accordingly it is important that *prescriptions containing those drugs not be re*newed without the physician's consent. Many prescriptions should contain the order *Non Repetatur* which signifies that they are not to be renewed. Today the pharmacist is cooperative and in most instances will not refill a prescription without the written order or verbal consent of the attending physician.

It is perhaps unnecessary to remind the physician to be as mindful of economy as is possible in ordering medication for children. Some of the endocrine products, intramuscular injections, vitamins and more recently the corticosteroids are prohibitively costly to many patients, particularly among parents of the low income group. Frequent changes of prescription should be avoided.

Preparation of the Skin

The skin, as an organ of respiration, under normal conditions continuously exchanges carbon dioxide and oxygen. Physiologically the pH of the skin is slightly on the acid side—a feature spoken of as the "acid mantle." In treating dermatoses by topical *applications* it is desirable, insofar as possible, that the acid mantle of the skin be preserved. This is important in order that the normal physiologic functions of the skin may be carried on. Accordingly topical remedies should be applied in thin layers, changed at relatively frequent intervals.

Crusts, exudates and debris, the result of inflammatory processes, should be removed frequently by means of suitable bland emollients and detergents. As will be seen later most sick *skins tolerate the use of soap and water poorly* and to meet this situation, recently sulfonated oils and "wetting agents" of one kind or another *have been* introduced into dermatology as substitutes for alkali soap. Among the various emollients that might be mentioned are warm appli*cations of olive oil, expressed almond oil and* peanut oil. These serve as excellent cleansers of the skin that has been treated by various topical *agents. Occasionally a small amount of petrole*um benzin dissolved in olive oil or acetone and placed upon absorbent cotton or soft gauze may *be used to remove crusted lesions satisfactorily.* Mineral oil is a mixture of aliphatic hydrocarbons. It is popular with many dermatologists as a cleansing agent for the skin, but it has been found by others, including myself, to irritate the skin of infants and children at times, causing folliculitis, pruritus and erythema. I seldom, therefore, employ liquid petrolatum as a detergent. Instead, I use the official cold cream (Rose Water Ointment U.S.P.) without the oil of rose with a good detergent effect. The rose oil is omitted because it often causes irritation.

In applying lotions it is a good plan to have the pharmacist dispense the preparation in a wide-mouthed bottle. After the contents are thoroughly shaken, a small amount should be poured into a receptacle and then applied to the lesions by means of a soft paint brush. The common practice of pouring a lotion upon absorbent cotton is inefficient because the cotton absorbs the greater part of the lotion and yields an unequal distribution of that which remains on the skin.

It is generally believed that soap, by reason of its alkalinity, is injurious to a sick skin, al*though reports in the literature are somewhat* contradictory as to whether the harmful effects are due to the alkaline pH or to the calcium and magnesium soaps that result from precipitation

with hard water or to the irritating free fatty acids that result from hydrolysis.

The physician should remain constantly aware of the need to maintain the general health of the child through proper nutrition. No treatment, no matter how effective from the dermatologic therapeutic point of view is justified if it endangers the patient's nutritional status and health. In an infant with atopic dermatitis, for instance, strict curtailment of food could easily lead to impending acidosis and an appreciable loss of weight.

PHYSIOLOGIC REST AND RELIEF OF ITCHING

Rest is always important for the welfare of infants but particularly for infants suffering from pruritus. Sedatives are definitely indicated, therefore, whenever a dermatosis interferes with the infant's or child's rest and sleep but they should be of a mild nature that can be tolerated without upset to the child's gastrointestinal system and preferably not habit forming. One of the barbiturates, such as phenobarbital or chloral hydrate, is to be preferred. The dose of either drug should be enough to cause rest and sleep. I seldom prescribe less than 0.016 Gm. (¼ gr.) of phenobarbital sodium (soluble phenobarbital) for very young infants and frequently prescribe as much as 0.03 Gm. (½ gr.) for somewhat older infants, to be given every three or four hours to produce rest. Nor have I ever seen untoward effects from the use of barbiturates given in the manner described. I have also used as much as 0.32 Gm. (5 gr.) of chloral hydrate per day for infants without any harmful effects. Chloral hydrate has a low index of sensitivity and for this reason is a popular sedative with most dermatologists. Nevertheless, the soluble phenobarbital in syrup of orange is preferable, although the official elixir (Phenobarbital Elixir U.S.P.) containing 16 mg. (¼ gr.) per teaspoonful may be used instead. The small amount of alcohol contained in the elixir is not habit forming or harmful when given over period of several days. The following prescriptions illustrate the manner in which such sedatives may be ordered

℞
Soluble Phenobarbital 0.78 Gm. (gr. XII)
Syrup of Orange 90.0 cc. (fluid oz. III)
Misce et fiat
Signa: One (1) teaspoonful in orange juice every 4 hours (for child 3 years)

℞
Chloral Hydrate 3.1 Gm. (gr. XLVIII)
Elixir Benadryl 45.0 cc. (fluid oz. I ss)
Syrup of Raspberry q.s. ad 90.0 cc. (fluid oz. III)
Misce et fiat
Signa: One (1) teaspoonful every 3 hours, two (2) teaspoonfuls before bedtime (for child 5 years)

Generally narcotics belonging to the opium series, such as camphorated tincture of opium (paregoric) and codeine, should be avoided, since these remedies increase the pruritus and are not well tolerated by most infants and children. However this statement requires some modification since occasionally one must resort to this group of remedies when all other sedatives fail to bring rest and sleep.

Topical remedies also should be prescribed for the relief of itching. Among them, the colloidal starch bath and the oatmeal bath are valuable, since either serves to allay acute erythema and itching. Several commercial preparations of starch, such as *Argo* and *Linit*, are available in hydrolyzed form and do not require boiling before use. They need only to be mixed with water and stirred with a spoon or wooden stick until the mixture is milky white, when it may be added to the water of the bath. On the other hand, ordinary starch should be prepared by adding ½ lb. of cornstarch to a quart of water transferring the mixture to a pot and heating to the accompaniment of constant stirring until the starch takes on the appearance of ground glass. After the paste has cooled, it may be applied to the skin. The infant is then given the customary bath, in which he may remain for from 5 to 10 minutes provided the room is sufficiently warm. After the bath, the skin should be patted gently with a soft towel or layers of soft gauze. Under no circumstances should it be rubbed. A colloidal bath may be given once or several times a day. To finish, a fine unscented talc may be used to dust the skin, but any talcum powder contain-

confidence of the patient, who may doubt the ability of the physician who recklessly prescribes large amounts of drugs that are expensive, wasteful and unnecessary

Answers to the following questions are helpful in deciding the quantities of medicaments to order (1) Are the lesions restricted to a small area of the skin or do they cover large areas of the body? (2) Approximately how much of the preparation will be required for a single treatment? (3) How often will it be necessary to use the preparation? Before retiring? Every three or four hours? In the morning and at night? (4) Will it be necessary to see the patient again in a few days, a week or after several weeks?

Copies of prescriptions are frequently requested by patients, particularly those who reside *in distant cities* and who *travel. Too some* patients will require renewal of prescriptions for refills during extended holidays. Under certain conditions, for example when ordering local anesthetics such as benzocaine or a sulfonamide the quantities prescribed are small and the medicament must not be used for long periods at a time Accordingly it is important that prescriptions containing those drugs not be renewed without the physician's consent Many *prescriptions should contain the order Non Repetatur* which signifies that they are not to be renewed. Today the pharmacist is cooperative and in most instances will not refill a prescription without the written order or verbal consent of the attending physician.

*It is perhaps unnecessary to remind the phy*sician to be as mindful of economy as is possible in ordering medication for children Some of the endocrine products, intramuscular injections, *vitamins and more recently the corticosteroids* are prohibitively costly to many patients, particularly among parents of the low income group Frequent changes of prescription should be avoided

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infants and younger children, particularly when a large area is involved and when extensive acute inflammatory lesions are present.

10 Avoid the use of proprietary preparations of unknown composition and expensive drugs when remedial agents in the U.S.P and the N.F can be used.

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ing zinc stearate should by all means be avoided.

A kaolin bath is also very soothing to a highly inflamed skin Kaolin (Kaolinum, N F) is a native hydrated aluminum silicate, powdered and made free from gritty particles by elutriation. It is closely related to bentonite and is employed in pharmacy as a distributing and filtering medium. It may be added to water in proportion of ¼ lb of bentonite to 10 gal of water The kaolin bath popular with many German dermatologists has not yet been popularized in this country

The use of handcuffs, elbow splints and other devices to prevent *scratching is good therapy* Such mechanical devices serve to prevent further trauma of the skin and secondary infection by the ever-present staphylococci and streptococci.

In addition to the *preceding measures, antipruritic drugs (Chapter 9) may be prescribed by* addition to lotions or ointments. Of the various topical antipruritics I like best menthol 0 1 per cent or solution of coal tar (commonly known as *Liquor Carbonis Detergens*, N F) *1 to 5 per* cent or phenol 0 5 to 1 0 per cent, either alone or in combination

A SUMMARY IN TEN USEFUL RULES

1 Never prescribe a remedy without a clear-cut indication If you must order an ointment or topical remedy prescribe such remedies that you are sure will *do no harm* e.g., Burow's paste, consisting of aluminum acetate 10 parts anhydrous lanolin 20 parts zinc oxide paste, 30 parts. Always inquire as to wool sensitivity Avoid the use of lanolin in wool-sensitive patients. Remember that *many of the simpler disorders* are frequently worsened and traumatized through the indiscreet use of topical remedies or through self medication

2. Make it a practice to follow the good rule *The more acute the dermatoses the milder the topical therapy*

3 Use simple remedies. Prescribe all topical remedies in mild concentration at first and increase concentration gradually as indicated. Remember that contact dermatitis may result from the indiscreet use of topical remedies. Such dermatoses have been encountered with great frequency and have been called "therapeutic dermatitis, overtreatment dermatitis" and by other descriptive names. Among these remedies are tar mercury iodine, salicylic acid phenol menthol benzoic acid, Nupercaine, Butyn and the sulfonamides, *many of which are definitely* skin sensitizers.

4 Choose the proper remedy in terms of the existing cutaneous disorder When edema is present (any dermatosis irrespective of cause) *characterized* by erythema, vesiculation oozing of the skin pain and local discomfort (burning sensation) use continuous wet dressings—not ointments—until the acute signs have subsided *(24-48 72 hours) In the subacute phase of any* dermatosis use soothing remedies pastes in preference to ointments, since pastes absorb residual fluid as a sponge absorbs water In the chronic phase use remedies that are stimulating; e.g the tars salicylic acid or perhaps a mild dose of roentgen ray

5 Know the composition of the remedy you order

6 Prepare the skin properly Always treat a sick skin with gentleness, never harshly For cleansing remember that a starch bath is excellent; also emollients, slightly warmed and applied with absorbent cotton e.g *olive oil* sweet almond oil peanut oil mineral oil On the other hand avoid ordinary soap which is frequently irritating to a sick skin Instead use superfatted soaps such as Basis soap and hyper-oilated soap *unscented. Sulfonated soaps can* also be quite useful

7 For generalized dermatoses, baths are generally preferred to ointments. Shake lotions are always serviceable

*8 Avoid insofar as is possible the use of oint*ments over extensive lesions in hot weather Shake lotions (evaporating lotions) are often serviceable.

9 Avoid the use of boric acid as a wet dressing and boric acid ointment in the treatment of

ANTIBIOTICS.—Antibiotics are biological products used in the treatment of infections caused by bacteria and viruses. They are often referred to as "bactericidal" or "bacteriostatic in their therapeutic effects and, when remedial in the treatment of virus infections, as "virucidal. *Examples*: Penicillin, streptomycin, tyrothricin, bacitracin, and Aureomycin.

ANTIHYDROTICS.—Antihydrotics are remedies used to stop excessive sweating, either local or general. *Atropine sulfat* the alkaloidal salt obtained from belladonna, when administered per os or subcutaneously checks all of the body secretions except urine and breast milk. Localized sweating (feet, axillae, groins, etc.) may be treated conveniently by soaks of *potassium permanganate* or the local application of *alum*, or a 1 5 per cent solution of *formaldehyde* A new parasympatholytic (anticholinergic) drug administered by mouth is *Banthine*

ANTILUETIC (ANTISYPHILITIC) AGENTS.—These are remedies used in the treatment and cure of syphilis. *Examples*: Arsphenamine, neoarsphenamine, bismuth subsalicylate and the antibiotics, such as penicillin.

ANTIPARASITIC AGENTS.—These agents or parasiticidal remedies include chemicals that destroy parasites whether of animal or vegetable origin. The term, a broad one, also includes agents employed to destroy fungi (fungicidal and fungistatic remedies) in, for example, ringworm of the scalp nd of other areas of the skin, and remedies used to destroy the causative insects in the parasitic diseases such as acari and intestinal parasites, lice infestation, etc. More specific types of antiparasitic agents are defined as follows

Pediculicide —A remedy that destroys the pediculus, whether the parasite infests the scalp (capitis) body (corporis) pubic region (pubis) or eyelashes (phthiriasis) *Examples*: Mercury compounds, larkspur fishberries, copper compounds, DDT (dichloro-diphenyl trichlorethane) and hexachlorocyclohexane.

Scabicide —A remedy aimed particularly at destroying the acarus mite (acarus scabiei) *Examples* Sulfur and its compounds, Peru balsam, styr x, benzyl benzoate and insect repellents like pyrethrum, derris root (rotenone)

Fungicide —A remedy that kills fungi, as in ringworm of the scalp (tinea capitis) of the glabrous skin (tinea corporis) of the toes and feet (dermatophytosis) and of the crural area (tinea cruris) *Examples*: Salicylic acid, benzoic acid, Whitfield's ointment (Ointment of Benzoic and Salicylic Acid, U.S.P) iodine, phenol, mercury sulfur and the volatile oils, the saturated and unsaturated fatty acids, propionic, undecylenic acid.

ANTIPHLOGISTICS.—Antiphlogistics are remedial gents capable of reducing inflammation. The term is synonymous with soothing agent. *Examples*: A per cent solution of boric acid, an infusion of chamomile flowers, aluminum acetate solution, mild concentrations of silver nitrate, etc., all employed as wet dressings.

ANTIPRURITICS.—These are remedies or agents which overcome itching (pruritus) and which act by paralyzing the terminal sensory nerve fibers of the skin. *Examples*: Menthol (acting upon the cold receptors of the skin to produce a sensation of coolness and vasoconstriction) camphor thymol, and chloral hydrate. These chemicals may be added directly to a lotion or may be incorporated in an ointment. Antihistaminic ointments and creams have been used successfully as antipruritic remedies in many instances in which the pruritus is due to allergy Many of the more recent pharmaceuticals, such as pyribenzamine ointment, Benadryl ointment and thephorin ointment are available as antiprurities, and many of the official detergents, soothing, healing nd astringent agents, because of their cooling, decongestive and protective action, also can assume antipruritic roles. At the same time, the colloidal starch bath still remains one of the most effective means for combating a generalized pruritus.

ANTISEBORRHEIC AGENTS.—These remedies control any excessive secretion elaborated upon the skin by the sebaceous glands. Many of the antiseborrheic agents produce their therapeutic effect because of either a keratoplastic or keratolytic action. *Examples* Precipitated sulfur resorcin, salicylic acid and ammoniated mercury

ASTRINGENTS.—Remedies that contract or constrict tissues by compelling either coagulation or the precipitation of albumin. In other words, such agents cause a contraction of any exudate resulting from an inflammatory process forming albuminates (proteinates) Therefore,

6

The Remedial Agents

FOR PRACTICAL purposes it is customary to classify the remedial agents employed therapeutically in the treatment of skin diseases under a relatively few headings. This system of classification is designed to indicate readily the pharmacodynamic action of a remedy Strictly speaking, many chemicals possess several actions. Thus, for example Pine Tar Ointment, U.S.P *a remedy valuable in the treatment of atopic* dermatitis, is generally classified as a reducing agent. However investigation has shown tar to be a stimulating remedy as well, its action being keratoplastic in that it encourages the reproduction of the basal cells of the epidermis. So too some soothing agents (for example, silver nitrate) are astringent as well as healing Thus in topical therapy the concentration of the drug changes the action of the chemical Silver nitrate in 0.25–0 5 per cent strength has an astringent action (silver proteinate being formed when in contact with serous discharges and *abraded surfaces of the skin)* while in 5–10 per cent strength it exerts a drying effect and is a powerful germicide. Fused silver nitrate (lunar caustic) is destructive or caustic in its action Again, salicylic acid in the strength of 0 5–1 0 per cent is antipruritic In strength of 1–3 per cent it is keratoplastic, while in concentration of more than 3 per cent, it is keratolytic. The same holds true of many other drugs and chemicals. The following more or less arbitrary classification may serve the dermatologist usefully

ABSORBENTS.—*Absorbents are drugs that* absorb moisture and secretions. Certain dermatoses, *for example impetigo contagiosa in which* there is present a considerable amount of exudate, tend to spread the infection upon normal uninvolved areas of the skin. The use of a bactericidal drug containing an absorbent, which will absorb the exudate and hold it localized at the site of the active lesions will curtail the spread of the infection. *Examples* Bentonite, *kaolin Fuller's earth.*

ACARICIDE.—An acaricide is an agent that destroys acarids or mites. *Examples* Sulfur the balsamic resins (Peru balsam) and more recent, the gamma isomer of hexachlorocyclohexane and N-ethyl-o-crotono-toluidide.

ANTIBACTERIAL AGENTS AND ANTISEPTICS.—These agents are similar in their action and are sometimes referred to as cellular poisons they are known also as germicides. Briefly they may be defined as chemicals that prevent the development of bacteria. Further they are divided into bactericidal agents, i.e. those that kill bacteria and bacteriostatic agents, those that prevent the growth and development of bacteria. *Examples* Phenol ammoniated mercury the *aniline dyes, silver nitrate potassium permanganate* and many of the antibiotics such as penicillin, bacitracin, and streptomycin

It should be remembered in the treatment of skin disorders in children that the use of strong germicides, such as mercury and the phenol compounds may injure the skin and delay healing Accordingly when such remedies are prescribed they should be ordered only in mild concentrations.

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the beneficial effect from the topical use of silver nitrate, for example, either as a bath or when applied to the skin upon a restricted area, is dependent upon its chemical combination with the proteins of the body to produce silver albuminate. Similar compounds are produced by the salts of the heavy metals such as lead (solution of lead subacetate) and by alum (solution of aluminum acetate) *Potassium permanganate* too is a powerful oxidizing, germicidal and astringent remedy *Tannic acid* one of the most powerful astringents derived from the vegetable kingdom has been popular in the treatment of burns and scalds However it should not be used over large surfaces of the skin because of the danger that its absorption may result in necrosis of the liver Bismuth subcarbonate and bismuth subnitrate when added to lotions or incorporated in an ointment are also astringent.

CAUSTICS —Caustics, or escharotics, are chemicals employed to destroy living tissue. For example, a granuloma of the umbilical cord is best destroyed by the application of *lunar caustic (fused silver nitrate stick)* Exuberant granulations are similarly destroyed by the local application of *silver nitrate copper sulfate* (bluestone) or *acid nitrate of mercury* Although many dermatologists use the terms caustic" and "escharotic" as synonyms, the term escharotic" is sometimes reserved for those chemicals that destroy pathologic tissue for example, nitric acid employed to destroy warts. In any case, both of these remedies are also used in the treatment of various indolent fissures, ulcers of the skin and mucous membranes. *Carbon dioxide snow* (dry ice) is used in the treatment of certain birthmarks like hemangioma

CICATRIZING.—This is a term of unfortunate connotation and indeed is apt to be misleading since it implies only that healing occurs by scar formation. There are, of course many dermatoses in children, such as lupus vulgaris and lupus erythematosus, which involve the deeper structures of the skin and of which the end result frequently is scarring. This result however is not what is properly meant by cicatrizing. Accordingly the word should be replaced by a better term—for example *epithelizing* —since many of the more superficial dermatoses heal by regeneration and not by repair with scar formation. An excellent preparation available in ointment and generally not sufficiently appreciated by the profession as a healing remedy is the azo dye, scarlet red which stimulates regeneration of epithelium. *The National Formulary* recognizes a 5 per cent scarlet red ointment.

DEMULCENTS —Demulcents are mucilaginous substances employed to soothe and protect irritated and inflamed mucous membranes or any exposed parts of the body *Example* Acacia and tragacanth.

DEODORANTS.—These are drugs, chemicals or preparations used to destroy or conceal bad odors. *Examples* Cresol phenol, formaldehyde, and many of the volatile oils.

DEPILATORIES —These are chemicals employed to remove superfluous hair *Example* Calcium sulfide.

DETERGENTS.—Detergents are cleansing agents. Abramowitz has defined a suitable detergent as one that removes all the various elements that collect on the skin without injury to the normal or affected epidermis. *Examples.* The best example is ordinary soap with warm water Within recent years newer compounds known as sulfonated oils of which class there are many proprietaries, have been introduced as substitutes for soap Examples are Acidolate Dermolate, and pHisoderm. Any chemical or preparation which loosens and removes dirt, debris, crusts etc., accumulated upon the surface of the skin from without or within, as the result of inflammatory reactions of the skin, may be considered a detergent. It is important always to remember that in treating dermatoses, proper cleansing of the skin before any topical application is the first essential for optimum therapeutic effect.

DISINFECTANTS (antiseptics) —The terms disinfectant and "antiseptic" are frequently used synonymously A disinfectant may be defined as a chemical that destroys bacteria while an antiseptic is one that prevents the growth of bacteria. The chemical that destroys bacteria with their spores is called a complete disinfectant. An agent that destroys the bacteria but not the spores is known as an incomplete disinfectant. *Examples* Potassium permanganate, weak solutions of bichloride of mercury phenol thymol.

FUNGICIDES.—See Antiparasitic Agents.

INSECTICIDES.—These are preparations employed to destroy insects. They have been classified as follows.

Stomach poisons.—These poisons are for insects with chewing mouth parts. They include the arsenicals, fluosilicates, and certain new organic compounds, including sprays and dusts, applied to the host or given as poisons in attractive baits.

Contact insecticides.—These are insecticides which kill insects by direct or indirect contact. *Examples:* Oils, sulfur nicotine, pyrethrum, derris and some of the new organic chemicals.

Fumigants.—Fumigants are gases or fumes used for the control of insects in enclosed spaces. The important fumigants are hydrocyanic acid gas, calcium cyanide, ethylene dichloride with carbon tetrachloride, methyl bromide, chloropicrin, nicotine, carbon disulfide and sulfur (sulfur dioxide gas)

Soil insecticides.—Soil insecticides include those used for the control of soil-infesting insects. They may be fumigants, contact insecticides or stomach poisons. *Examples.* Nicotine, pyrethrum, sodium cyanide, kerosene emulsion, carbon disulfide, arsenate of lead, corrosive sublimate.

Repellents.—Materials such as creosote, citronella and Bordeaux mixture are repulsive to insects, as also are certain new chemicals.

Combinations.—There are combinations of compatible chemicals which are useful for more than two types of insects and fungi for example, a combination of insecticides for sucking and chewing insects, and combination of an insecticide and fungicide.

New organic chemicals for pest control.—These newer organic materials include ANTU compound 1080 DDT benzene hexachloride compound 1068 (chlordane) DD soil compound HC acrylon, and azobenzene.

KERATOLYTICS.—Agents that cause desquamation of the superficial corneal layer of the skin are known as keratolytics They are sometimes referred to as desquamating agents. There are many keratolytic agents, official as well as unofficial, that are valuable to the dermatologist in his routine practice with children. One of the best and most widely used is *salicylic acid* in strength of 3 per cent or more. *Whitfield's Ointment U.S.P.* (unguentum acidi benzoici et salicylici) is a powerful keratolytic but should never be used in concentrated strength with children. It should be diluted with three to four times the amount prescribed of petrolatum. Resorcinol, precipitated sulfur and many of the acids, such as trichloroacetic acid, are keratolytic in their action. This group is useful to the dermatologist when the scaly type of dermatosis (e.g., psoriasis or chronic eczema) is to be treated.

KERATOPLASTICS.—A keratoplastic agent is essentially an emollient, that is, a skin softener Many of the vegetable oils and fats (e.g., olive oil, peanut oil, sweet almond oil) are keratoplastic in their therapeutic effect. Salicylic acid when used in concentration of less than 3 per cent is definitely keratoplastic and not keratolytic; in short, it stimulates the reproductive cells located in the basal cell membrane so that there is an accelerated reproduction of new cells.

LOCAL ANALGESICS.—Drugs and preparations used topically to relieve pain are described as local analgesics. *Belladonna ointment* rubbed into a restricted area of the skin, paralyzes the terminal sensory nerve fibers and so relieves pain.

LOCAL ANESTHETICS.—Local anesthetics are similar in action to local analgesics the terms are used synonymously By their topical application they act by depressing the sensory terminal fibers of the skin and impairing sensation and thus relieving pain. Many of the newer compounds such as ethylaminobenzoate (anesthesin) Nupercaine, 1 per cent in the form of an ointment (e.g., Nupercainal) are available on the market as local anesthetics. Many such remedies possess a high index of sensitivity

MITICIDE.—This is a remedy or agent destructive to mites. The term is used synonymously with acaricide.

OVICIDE.—An ovicide is a remedy that destroys the eggs of parasites and prevents them from hatching. It differs from a pediculicide and other parasitic remedies in that the latter while destructive to the parasite or mite, does not necessarily destroy their ova. Indeed, under proper conditions, the ova treated with parasiticidal remedies may mature and hatch. Benzocaine (ethylaminobenzoate) contained in Eddy's formula (12 per cent) is also effective for the treatment both of pediculosis and of scabies. In addi-

tion to benzocaine, Eddy's formula contains DDT benzyl benzoate Tween 80 and water

REDUCING AGENTS.—The term "reducing agent," coined by Unna has been greatly misinterpreted and abused and for this reason it would be best to drop it entirely In the strict sense, a "reducing agent" is a chemical that abstracts oxygen from the epidermis *Examples* are to be found in the various tars (pine, birch beech and juniper) coal tar ichthammol resorcin sulfur chrysarobin mercurials and many other chemicals. These remedies are often combined with salicylic acid, which acts as a mordant or fixative that allows more lasting and penetrating action on the tissues.

REPELLENT —A repellent is an agent which drives away or prevents annoyance or irritation by insect pests. A mosquito repellent once popular among the laity is citronella oil.

SCLEROSING AGENTS —The term "sclerosing agent" as ordinarily used refers to certain chemicals such as 70 per cent invert sugar sodium morrhuate and quinine urethane solution useful for the treatment of varicose veins and of cavernous angiomas. A localized clot or thrombus resulting from an injection obliterates the blood supply to the tumor such is the operational design The use of sodium morrhuate, however for the treatment of cavernous angioma can be attended with danger to the degree that several instances of death have been reported from its use in children

SUN SCREENS OR TANNING AGENTS.—The terms "sun screen" and "tanning agents usually refer to preparations which, when applied to the skin will shut out the ultraviolet rays between 2900 and 3200 Angstrom units. However such preparations will not protect the skin against an inflammation caused by the other rays of the visible spectrum such as visible blue light.

A disadvantage common to all sun screens is that because they are sensitizers they may cause a dermatitis. *Examples* Ordinary yellow petrolatum is an efficient sun screen but the white petrolatum, which is yellow petrolatum that has been bleached will not cut out the rays that cause tanning. The thicker the application of the material on the skin and the less intense the exposure to certain rays of the ultraviolet spectrum the more protective the screen Tannic acid calamine titanium dioxide and wool fat are other examples of sun screens.

SURFACE ACTIVE AGENTS —According to the *United States Dispensatory* (25th ed Philadelphia J B Lippincott Company) a surface active agent is any substance which, when added to a liquid lowers the interfacial tension at any boundary of the liquid The term is a broad one and includes substances commonly referred to as wetting agents, surface tension depressants, detergents, dispersing agents, emulsifiers, penetrants, solubilizers, leveling agents, cleaning agents etc. The editors of the *United States Dispensatory* point out that all these terms are by no means synonymous and that accordingly a given surface active agent which is effective in one category is not to be considered as necessarily having equal effectiveness in the others. *Examples* Sodium Lauryl Sulfate U.S P Benzalkonium Chloride U.S P Spans and Tweens as well as innumerable proprietary and commercial products.

WETTING AGENTS.—This term also of recent origin, may be defined as a substance which if added to water will cause that liquid to give a higher degree of wetting (or to possess a lower interfacial tension) against a contiguous face than could be obtained with pure water *Examples* One of the best wetting agents (or detergents) is soap Aerosol O T (dioctyl ester of sodium sulfosuccinate) is another of the most powerful wetting agents. Popular commercial wetting agents include preparations marketed under the names of Acidolate, Dreft Drene, and Teel.

Wetting agents also include compounds such as the sulfonated oils the derivatives of fatty acids, the esters and higher alcohols (cetyl alcohol lauryl alcohol) and amides of many of the sulfonated fatty acids. They are satisfactory skin cleansers and make excellent shampoos (Acidolate Drene, etc.) These remedies are less irritating to the skin than are the alkaline soaps. Some wetting agents make excellent creams and ointments, many of which are marketed under proprietary trade names.

FORMS OF TOPICAL REMEDIES

The key to successful therapeutics in the treatment of dermatoses in infants and children lies in the use of simple remedies whenever possible. A safe rule to follow in prescribing topical remedies is *the more acute the inflammation or the inflammatory dermatosis the milder the treatment*. Unquestionably many dermatoses are worsened and imposed upon by a contact dermatitis (dermatitis venenata) traceable to salves, lotions and other topical remedies that are too strong or otherwise unfitted for topical use with younger patients and act either as primary irritants or as sensitizers.

Solutions
(Wet Dressings)

Aim of Therapy

The purpose of continuous wet dressings is to restore a sick skin to normal—that is, to its usual physiologic functioning. This is the aim of the dermatologist when he orders a wet dressing for draining an edematous skin, whether the dermatosis be a simple contact dermatitis or an eczema. In selecting the ideal fluid for that purpose, it is important to remember that it should be of such a kind that it will not irritate further the already highly inflamed epidermis. It should preferably be of simple composition, readily available when required and comparatively nontoxic if it is absorbed by the exposed corium. Also, it is desirable that it be soothing to the area treated and economical to the patient's purse.

Application

Proper application is no less important than the choice of a proper remedy if therapeutic success is to be achieved in the shortest possible time. Continuous wet dressings mean exactly what the term implies—the dressings must be kept continuously wet and at a uniform temperature. Unfortunately this state all too rarely becomes an accomplished reality either at home or in hospital.

The material used to soak up and apply the remedial solution also is important to the success of the dressing. Absorbent cotton should never be used because it defeats by its own absorption the very purpose intended by the physician. Instead, several thicknesses of cotton, for instance, three or four layers of clean diaper material, should be used or when large areas are to be treated, a single thickness of Turkish towel. The material should be soaked thoroughly in the remedy and then the excess wrung out so that the material at last is neither too dry nor quite saturated. The test is that the remedial solution will not actually drip from the dressings. The solution should stand at room temperature and so should constitute a cool dressing. After the wet dressing has been applied to the appropriate area of the skin, it should not be covered by another impervious dressing, such as oiled silk, gutta-percha tissue or waxed paper. This negative precaution is necessary in order that evaporation of the fluid may not be interfered with and also because it is desirable to keep the dressing continuously wet. Ideally wet dressings should be changed frequently. Whenever an acute dermatosis becomes unusually distressing because of the increased heat, the dressings should be applied ice cold. So applied, the dressings will withdraw heat from the inflamed skin at the same time that they drain it of excessive fluid.

The use of wet dressings is a procedure wearisome to both patient and ministrant. Accordingly efforts to relieve the strain and monotony of the ordeal are worthwhile. A recumbent posture for the patient may be best in some cases, in others, a sitting one. But without respect to position, it is important that he be kept busy both during the day and also at night when he is awake for application of the dressings. Wet dressings are usually applied for 24–48 hours, seldom for longer periods, after which the edema will have subsided.

The Remedy

The most commonly used remedial agents for the purpose of wet dressings are aluminum

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Baths

Baths have specific therapeutic indications. They may be used for cleansing, for their astringent effect, for soothing effect or for antipruritic effect, or for a combination of these. Psychologically also, full baths serve a useful purpose. They give the mother an activity in place of the fretful passivity of waiting for the lotion, ointment or cream to produce its topical effect. Usually a child with a dermatosis is given an ointment or a lotion. When results are not forthcoming, the apprehensive mother soon revisits the physician with the result that a second ointment or lotion is likely to be prescribed. The mother who is told to give her baby a bath is made to realize that various modalities of treatment are being tried and further that the physician who orders the bath is treating his patients not routinely but individually. As a soothing topical application there is nothing that compares favorably with the starch bath, and as mothers come to experience this truth, they gain a new confidence in and respect for the therapeutic armamentarium.

The primary reasons for giving an infant or a child a colloid bath or a medicated bath are either to cleanse the skin or to soothe it. The constant use of ointments, lotions and other remedial agents employed topically in the management of acute and chronic dermatoses frequently results in the accumulation upon the skin of layers of fatty medicaments that are removed with difficulty by ordinary emollients. Also, the products of inflammation, such as serous discharges, exudates, scales and crusts, become superimposed upon the skin. These are not readily removed by emollients and soon, unless a cleansing bath of soap and warm water is used, interfere with the proper functioning of the skin. If the skin is to return to a normal condition the sweat and sebaceous glands and their ducts must be kept free at all times; otherwise, their physiologic functions will be interfered with by the plugging of their outlets upon the surface of the skin.

It is important that the bathroom should be reasonably warm, especially during the cold months. Chilling should be prevented. The temperature of the water should be such as to make the patient comfortable, neither too hot nor too cold (97° F.). It can be tested by immersing the elbow (not the hand) in the water. There should be an adequate supply of soft towels, linens, blankets, etc., with which to dry the skin and keep the patient warm immediately after the bath. A common mistake in drying the skin is rubbing it with a towel, instead of patting it gently. Rubbing increases congestion and increases pruritus. Only soft Turkish towels should be used. To provide comfort while the patient is immersed in the tub of water, a foam mattress, latex, or a Peter Cooper collar is useful to prevent the child's buttocks from being exposed directly to the bottom of the tub. Ordinarily the patient may be allowed to remain in the bath for a period of five or ten minutes, although there are many exceptions to this rule, depending on the nature of the dermatosis and what is sought by the bath. Usually after a ten-minute period the water cools rapidly.

Soothing Baths

The starch bath.—Starch is always available, cheap, and a general household item. A starch bath acts as an excellent detergent and effectively removes previous topical applications applied to the skin lesions. The polysaccharides in the starch are responsible for this effect. Further, a starch bath is an antiphlogistic of the first order: it allays inflammation and soothes inflamed and irritated skins. The starch bath serves the purpose of an antipruritic and is useful when the commonly prescribed antipruritic remedies such as phenol, menthol or tar fail to overcome pruritus, or when their use is contraindicated because of an acutely irritated and inflamed skin. Of all the baths, the starch bath, in this writer's opinion, is by far the best, no other bath rivaling it in quieting an angry, highly inflamed skin and in giving the patient rest.

The chamomile bath.—Chamomile contains as its active constituents alcohol-soluble volatile oil containing the highly unsaturated, blue-colored hydrocarbon azulene, malic acid, tannin and other principles. A bath of chamomile flowers may be prepared as follows. To 1 lb. of German chamomile flowers, contained in a suitable receptacle, add 4 gal. of hot water. Cover the vessel with a lid and allow the con-

acetate in the form of the official aluminum acetate solution potassium permanganate, official as the crystals or in the form of tablets silver nitrate, official and chamomile flowers.

ALUMINUM ACETATE SOLUTION U.S.P (BUROW'S SOLUTION)—This is perhaps the most generally prescribed remedy when wet dressings are indicated. This solution should never be applied to the skin undiluted that is, in full strength. For older children it should be mixed in the proportions of 1 part to 10 parts of water For younger children, 1 part of the aluminum acetate solution should be mixed with 20 parts of water and for very young infants (under 6 months) 1 part should be mixed with 30 parts of water (*See Formulary* ℞ 5)

POTASSIUM PERMANGANATE U.S.P (POTASSIUM PERMANGANATE TABLETS N.F)—Therapeutically potassium permanganate applied to the skin acts as a powerful antiseptic oxidant and astringent. Accordingly it is useful to the dermatologist either as a soak or as a wet dressing in treating secondary infections caused by staphylococci and streptococci, either singly or together A 1 3000 *solution is effective for hyperhidrosis* of the feet. A 1 10 000 solution is an excellent treatment for trichophytosis either *as a soak or as a wet dressing, followed by a* simple shake lotion or a paste. (A lotion is better than ointment or paste during hot weather) For wet dressings or soaks it is customary to employ either a 1 8000 or a 1 10 000 solution For a continuous bath a 1 20 000 solution may be used but for infants a further dilution to 1 40 000 should be made.

Potassium permanganate has the disadvantage of staining linens, towels and tubs a brownish red, which is difficult to remove. However the stain can be removed by a 10 or 20 per cent solution of sodium bisulfite, a 25 per cent solution of sodium hyposulfite (sodium thiosulfate) or a 3 per cent solution of hydrogen peroxide

Tablets offer a convenient method for prescribing potassium permanganate. Among the sizes available are 0 06 Gm 0 12 Gm. 0 2 Gm and 0 3 Gm. One 0 06 Gm tablet dissolved in 500 cc. of water yields approximately a 1 8000 solution. A tablet of the same strength dissolved in 1000 cc of water *yields approximately* a 1 16 000 solution. An 0 3 Gm. tablet dissolved in 1000 cc. of water yields a 1 3000 solution. A tablet of the same strength, i.e., 0.3 Gm added to 3 qt (3000 cc.) of water makes a 1 10 000 solution if added to 6 qt. of water it makes a 1 20 000 solution. It is important that the crystals or tablets be wholly dissolved before the preparation is used otherwise a permanganate burn may occur (*See Formulary* ℞ 3 9)

SILVER NITRATE U.S.P—Silver nitrate in the strength of ⅛ to ¼ of 1 per cent as a wet dressing or for an immersion bath for generalized dermatoses finds wide favor among dermatologists. It is a powerful germicide and therefore serviceable against impetiginized dermatoses for example, impetiginized eczema (atopic dermatitis) Or again, it proves good medication for exudative skin lesions.

I know of no instance of toxic effects resulting from the absorption of silver nitrate in its topical application in wet dressings. Silver nitrate properly diluted for wet dressings or bath when brought into direct contact with exudation or an abraded surface (even when applied to the skin as lunar caustic) forms a coagulum of silver proteinate that is both astringent and soothing *in its effects In fact as a new compound it* forms a kind of impermeable coating over the lesions, both quieting and sealing off the affected area.

CHAMOMILE FLOWERS (MATRICARIA)—Of all the topical remedies employed in dermatology *either for a wet dressing or for a bath, none* compares favorably with an infusion of chamomile flowers. It should not be confused with *Anthemis nobilis (English chamomile) which is* much inferior for the purpose of a wet dressing. Chamomile is an economical remedy It is prepared as a tea *as follows. Place 1 tablespoonful* of the dried flower heads in a suitable container and pour upon them 1000 cc (1 qt) of hot water *Put the container over a low flame and let* the contents simmer from 0 to 30 minutes, then strain the resulting solution through several *layers of gauze The cooled solution should have* a light pink color not unlike that of "pink lemonade" and a pleasant aromatic odor It is *believed that azulene is the active anti inflammatory* principle of the oil contained in the flower but its potency is further enforced by the pres*ence of* sesquiterpenes, sesquiterpene alcohols, paraffin hydrocarbons, umbelliferone methyl ether furfurol, and a fatty acid.

Alcohol
Ol. Oliv. aa 25.0

The body is first rubbed with the above solution. The child is then placed in a bath for 15-20 minutes. His body is then soaped and washed and ointment is applied.

Indication: Chronic, hard, infiltrated eczemas, psoriasis.

THE SULFUR BATH

℞
Sulfurated potash (liver of sulfur) 500.0
Signa: Dissolve 1 or 2 oz. in bath (20 gal.) of water at 95 F

A sulfur bath is indicated for extensive impetigo contagiosa, prurigo mitis and lichen urticatus. In addition to being antipruritic it is also mildly antiparasitic. A major objection is the disagreeable odor of hydrogen sulfide. The child is allowed to remain in the bath for about half an hour and then rolled in a soft bath towel without drying and put to bed. The skin may then be dusted with a fine unscented talc.

Lotions

The term "lotion" is applied to a suspension of insoluble powder in a fluid. A lotion may be expressed by the following formula. M + aqueous solution = lotion. "M" represents the medicinal substance, such as zinc oxide, bismuth subnitrate, resorcinol, etc., while the aqueous solution is the vehicle prescribed such as solution of calcium hydroxide, distilled water purified water U.S.P. etc. The vehicle may be an alcohol-aqueous solution instead of an aqueous vehicle. Suspending or dispersing agents may be included. The following prescription illustrates such a combination

℞
Zinc oxide 30.0 (basic chemical)
Purified talc 30.0 (adjuvant chemical)
Witch hazel water 30.0 (evaporating agent)
Calcium hydroxide
 solution q. s. ad 180.0 (vehicle)
 Misce et fiat lotio
Signa: Shake well. Apply by means of soft paint brush. To be dispensed in wide-mouthed bottle

Frequently an antipruritic agent is indicated. In such instances, one may add liquor carbonis detergens, 1 to 3 per cent; or phenol 0.5–1.0 per cent or menthol, 0.1–0.5 per cent. When phenol is added to the above prescription, a small amount of glycerin (16 cc.) should be included to keep it in solution and uniformly distributed. For the same reason, a small quantity of ethyl alcohol (8 cc.) should be added to the above prescription when menthol is prescribed.

The standard shake lotions contain 16 per cent of zinc oxide and talc. It is important when ordering shake lotions to restrict the powders to this amount, otherwise, the lotion will be thick and difficult to use. The following prescription illustrates a lotion in which both the zinc oxide and talcum are added in a 20 per cent strength

℞
Zinc oxide 24 (20%)
Purified talc 24 (20%)
Glycerin 12 (10%)
Calcium hydroxide
 solution q.s. ad 120.0
 Misce et fiat lotio
Signa: Shake well. Apply every 3 hours by means of paint brush.

Glycerin is added to the above prescription in order to aid the uniform suspension of the insoluble powders. More than 8 to 10 per cent of glycerin in a shake lotion often acts as an irritant, especially in the case of infants. Instead of glycerin, 6 per cent bentonite may be used as a suspending agent.

APPLICATION.—When a lotion is applied to the skin, the fluid in the lotion evaporates, leaving the powder as a deposit on the skin. By causing heat to be dissipated (decongestion) this produces a cooling sensation of the inflammatory lesions to which it is applied. In applying lotions to the skin, it is important to remember that the lotion should be distributed evenly over the affected part or parts that are being treated since an uneven distribution may defeat the very object being sought. Alcohol U.S.P. or witch hazel water, Hamamelis Water N.F. (Aqua Hamamelidis), the latter containing approximately 15 per cent by volume of ethyl alcohol, is generally added to lotions to aid the process of evaporation.

Lotions usually do not contain oil. When oil is added to a lotion, the preparation becomes an emulsion. Some preparations, for example, a 2 per cent solution of boric acid to be used by sopping it on the skin, is in the broad sense of the term also a lotion. The prescription, i.e., a

tents to simmer over a low flame for 20 minutes, then strain Add the strained fluid to 15 gal. of water in the tub Chamomile infusion may also be used as a Sitz bath for pruritus ani, which is rare in children and usually due to pinworms. The chamomile bath is valuable also in exudative dermatoses

THE OATMEAL BATH —This bath, which is also useful when a soothing bath is indicated, probably rates second in worth to the starch bath The oats must be old fashioned oats, or oatmeal and not the quick "3 minute" oats used in the preparation of oatmeal gruel. To prepare, take 1 lb of oats. Make a cotton bag of sufficient size place the oats in it and tie the open end securely with a long string to the hot water faucet. Allow the hot water to penetrate the oats, and then with the hands, express the mucilaginous content into the tub of water The oatmeal may be combined with bicarbonate of soda (baking soda) the temperature of the water should be 95 F (not hot)

CLEANSING BATH

THE SOAP BATH —For a cleansing bath ½ lb of Medicinal Soft Soap U.S.P (Sapo Mollis Medicinalis) also known as soft soap and green soap"† or the ordinary cake soap (unscented) is scraped and added to the bath. Medicinal Soft Soap U.S.P is prepared from a vegetable oil (this may be corn, cottonseed, linseed olive, or soybean or some similar oil) which has a saponification value not greater than 205 and an iodine value not less than 80 oleic acid, potassium hydroxide, glycerin and distilled water The glycerin which is intended to accelerate saponification may be omitted in the official preparation

THERAPEUTIC BATHS

Potassium Permanganate

℞

Potassium permanganate	6.0
Distilled water q.s. ad	120.0

Sig. Add one half (60 cc.) the contents of the prescription to 15 gal. of water (This makes approximately a 1 70,000 solution of potassium permanganate)

Allow the patient to remain in the bath for 20 minutes. Potassium permanganate is a powerful antiseptic, oxidant and astringent. It is useful as a bath in the treatment of multiple furunculosis (so-called) and also in the management of impetigo contagiosa that is widespread. It is a useful remedy in the management of the edematous stage of atopic dermatitis involving large areas of the body and also when wet dressings are impractical.

STIMULATING BATHS

TAR BATHS

Oil of Cade‡

Juniper tar (Cade oil) is sometimes used in the treatment of recalcitrant skin diseases, such as the psoriasis seen in older children. The lesions are painted with oil of cade or the oil is rubbed into the lesions before the patient is given a warm bath or a plain starch bath. The tar which acts as a stimulant, is also useful for its antipruritic effect.

Coal Tar Solution (Liq Carbonl Detergens)

℞

Coal Tar Solution U.S.P	500.0

Sig. Add from 1 to 4 fluid ounces to a tub of water at 95 F (½ tablespoonful for infants)

Like oil of cade coal tar solution is sometimes painted on the skin lesions before the patient is immersed in a tub of water The following is a formula for a *tar bath*

℞

Rectified birch tar oil		
Beech oil	aa	50.0

Aveeno, prepared from a concentrated gum-like fraction of oatmeal, is excellent as a colloidal bath. A cupful of Aveeno is sprinkled slowly into the tub of warm water

†The official soap is not green in color A variety of soft soap prepared from green colored oils, such as green olive oil or artificially colored is known as green soap.

‡The Almay Tar Bath is popular with many dermatologists when tar bath is indicated for its antipruritic effect. For infants and children it is recommended that from 1 to 3 tablespoonfuls of Almay Tar Bath be added to the tub of water The patient should be allowed to remain in the water approximately ten minutes in order to obtain the best therapeutic effect. The Almay Tar Bath has been used by the writer in the treatment of atopic dermatitis in infants and children with good results.

Alcohol
Oil Olive aa 25.0

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Misce et fiat lotio
Signa Shake well. Apply every 3 hours by means of paint brush

Glycerin is added to the above prescription in order to aid the uniform suspension of the insoluble powders. More than 8 to 10 per cent of glycerin in a shake lotion often acts as an irritant, especially in the case of infants. Instead of glycerin, 6 per cent bentonite may be used as a suspending agent.

APPLICATION.—When lotion is applied to the skin, the fluid in the lotion evaporates, leaving the powder as a deposit on the skin. By causing heat to be dissipated (decongestion) this produces a cooling sensation of the inflammatory lesions to which it is applied. In applying lotions to the skin, it is important to remember that the lotion should be distributed evenly over the affected part or parts that are being treated since an uneven distribution may defeat the very object being sought. Alcohol U.S.P or witch hazel water Hamamelis Water N.F (*Aqua Hamamelidis*) the latter containing approximately 15 per cent by volume of ethyl alcohol, is generally added to lotions to aid the process of evaporation.

Lotions usually do not contain oil. When oil is added to a lotion, the preparation becomes an emulsion. Some preparations, for example, a per cent solution of boric acid to be used by sopping it on the skin, is in the broad sense of the term also a lotion. The prescription, i.e., a

2 per cent solution of boric acid used as a continuous wet application upon gauze or cotton material upon the skin becomes a wet dressing. Accordingly the manner in which a preparation is to be used may determine whether the preparation should be called a lotion or a wet dressing. Like ointments, there are many different kinds of lotions, dependent upon the therapeutic nature of the medicaments contained in the preparation. Thus we have stimulating, soothing, antiseptic, astringent lotions and so forth. Lotions are far more popular with patients than are ointments since they are not greasy or messy *On the other hand, lotions are* bulky and inconvenient to handle when traveling and are therefore likely to be considered a nuisance.

INDICATIONS.—The indication for the use of a lotion is any acute dermatitis where a cooling effect is desired. The common practice of using absorbent cotton to apply lotions to the skin by soaking it with the lotion and dabbing it upon the lesions is bad economically since the cotton absorbs most of the lotion which the skin is supposed to receive. Instead a soft paint brush should be used. Too specific directions should be given to the pharmacist that the prescription for which a lotion is ordered should be dispensed in a wide-mouthed bottle

COMMONLY PRESCRIBED LOTIONS.—Lotions are sometimes referred to as watery paints. The following prescriptions illustrate types of lotions commonly prescribed for infants and children (*See Formulary* ℞ 10 25 26.)

Astringent Lotion.—*See Formulary* ℞ 12, 13 16 21

Cleansing Lotion

℞

Sodium borate	3 1
Potassium carbonate	0.78
Menthol	0.39
Alcohol	90.0
Hamamelis water	24 0
Distilled water q.s. ad	180 0

Misce et fiat lotio

Signa Apply morning and night

Indicatio Acne vulgaris (John Belisario)

Soothing Lotion.—*See Formulary* ℞ *11 21 22 25*

Bactericidal Lotion

℞

Mercuric sulfide	1.8
Precipitated sulfur	6 0
Zinc oxide	30.0
Glycerin	30.0
Diluted Alcohol U.S.P q.s. ad	180 0

Misce et fiat lotio

Signa Apply several times daily

Indication Impetigo contagiosa

See Formulary ℞ 25 29

Parasiticidal (Ovicidal) Lotion

℞

Benzyl benzoate	*10%*
DDT (Dichlorodiphenyl-trichloroethane)	1%
Benzocaine	r
Tween 80	2%
Distilled water q.s. ad	100.0

Misce et fiat lotio

Signa Apply at night—cover scalp with an improvised cap—cleanse scalp with soap and water following morning—may be applied to trunk and extremities

Indication For scabies, pediculosis capitis (pediculi and ova)

See Formulary ℞ 28 *for pediculosis capitis.*

Lotion for Dry, Scaly Type of Scalp (Seborrhea capitis) —*See Formulary* ℞ 14 17 18

Sun Screen Lotion.—*See Formulary* ℞ 98, 100

Sunburn Lotion

℞

Neutracolor	8.0
Titanium dioxide	8.0
Bentonite	*15.0*
Purified talc	20.0
Zinc oxide	20 0
Glycerin	20 0
Calcium hydroxide solution q.s. ad	*120 0*

Misce et fiat lotio

Signa Apply

Indication Prevention of sunburn

NOTE When a paste is desired, 10 per cent Hydrophilic Ointment U.S.P should be added to the above lotion

Antipruritic Lotion.—See Chapter 9 Pruritus. *See also Formulary* ℞ 11 26

Pastes

When powder and ointment are combined in equal amounts the composition of the newly formed preparation acts differently from an ointment Such a preparation called a paste, is remarkable for its potential absorptive property A paste, because it is porous, takes up fluids and exudates much as a sponge absorbs water Lassar's Simple Paste U.S.P (zinc oxide paste) is an example. It contains 25 Gm. each of zinc oxide and starch, the remaining 50 per cent of the ingredient consisting of white petrolatum. However because starch is a polysaccharide and ferments readily it is frequently an unsatis-

factory preparation, particularly when the lesions are of a bacterial nature. Accordingly some dermatologists prefer to substitute talc (magnesium silicate) for the starch. Again, when starch is used, as in the official Lassar's paste, the finished product becomes very hard in cold weather while during hot summer weather an additional quantity of starch is needed to give the preparation a firmer consistency.

Pastes are particularly indicated in the management of acute and subacute dermatoses. They are useful when edema and exudation are present, to absorb the products of the inflammation, serving very much the purpose of a sponge, which ointments cannot do. In this manner pastes prevent the spread of infection to adjacent, uninvolved areas.

Pastes will take up any kind of medication. However when drugs are incorporated into pastes the chemicals become less active than when they are added to ointments. Nevertheless, it is for this very reason that pastes are useful in treating chronic dermatoses where it is desirable to obtain the mild therapeutic effect of a medicament such as salicylic acid, coal tar pine tar or sulfur which otherwise may be definitely contraindicated because of the chronic disturbance.

Pastes are not greasy like ointments and do not lend themselves to rubbing. Instead, the pastes should be applied by "buttering the lint or gauze, which in turn should be placed in contact with the lesions. Perhaps pastes find their greatest usefulness during the subacute stages of inflammatory dermatoses, in that interim when wet dressings are no longer indicated, although there is still present a considerable amount of residual fluid in the epidermis and corium for which ointments containing stimulating medicaments are unsafe for topical application.

The following combination represents a useful antipruritic paste that is serviceable in the management of a severe itching dermatosis in children

℞

Phenol (½%)	0.25
Menthol (¼%)	0.12
Liquor Burowi*	10.0
Wool fat U.S.P. (anhydrous lanolin)	20.0
Zinc oxide paste U.S.P.	30.0

Misce et fiat pasta

Signa: To be applied upon lint or several layers of gauze 4 times daily

*Liquor Burowi is the other name for Aluminum Acetate Solution N.F.

See Formulary ℞ 64 65 66, 67

Zinc Paste

℞

Zinc oxide		
Talc	aa	25.0
White petrolatum		50.0

Misce et fiat pasta

Signa: As ordered

Indication: Absorption of exudates, serum, etc. in residual stage of atopic dermatitis

Ointments

Despite the many recent advances in therapeutics, ointments remain indispensable to the dermatologist. Apart from those agents that are specific for certain dermatoses, topical remedial agents incorporated in various ointment bases help to alleviate much local discomfort, pruritus and the burning sensation of the skin common to most inflammatory reactions.

Furthermore, when properly prescribed and applied, ointments serve to protect the skin from injury and are useful in aiding the lesions to undergo resolution and return the sick skin to its normal state. Happily many ointments possess an antiphlogistic effect. Further while unctuous agents are definitely helpful, as we have noted, to the prescriptionist, it should also be remembered that physiologically at least, the restoration of a sick skin depends largely on the immunobiologic response of the skin to the trauma inflicted upon it from any source. Accordingly the physician mission should be that of aiding Nature to rid the skin of those factors which may retard recovery. To these ends ointments are valuable with the proviso that the use of too strong ointments and of proprietary remedial agents of unknown composition must be condemned.

The proper use of ointments depends to a large extent on the choice of ointment base in which the remedial agent is incorporated. These bases may be classified either according to their composition or according to their penetrability. *New and Nonofficial Drugs* uses a terminology and classification based on the former and gives

four different types. (1) oleaginous, (2) absorbent, (3) emulsion (4) water soluble. However for purposes of therapy it is convenient to classify the bases according to their penetrability namely (1) epidermic, (2) endodermic and (3) diadermic. The first of these, as the name implies, is most useful when treating lesions that are situated superficially on the surface or outer layer of skin The endodermic and diadermic are more useful when the lesion is located in the deeper layers of the skin as in the case of ecthyma For use superficially the oleaginous and absorbent bases such as petrolatum or lard, are most effective, whereas the emulsion or water soluble type of base is indicated for use in lesions where it is necessary to penetrate deeper into the epidermis corium or subcutaneous tissues.

Once the proper base has been selected, the particular remedial agent may be incorporated. Table 9 gives the more popular ointments for topical application with their composition and specific indications. Table 10 lists some of the newer ointments containing antibiotics and the corticosteroids.

The introduction of the new antibiotics, antihistamines and corticosteroids with their adaptability to ointments and creams has changed the outlook on much topical therapy Many of the older ointments and creams have been replaced by modern ointments containing wide spectrum antibiotics and corticosteroids. Although some of the antihistaminic preparations used upon the

TABLE 9—POPULAR OINTMENTS OF PEDIATRIC USEFULNESS AND IMPORTANCE

Ointment	Composition	Indication	Comments
Ammoniated Mercury Ointment U.S.P (white precipitate ointment)	5% ammoniated mercury liquid petrolatum and white ointment	Germicidal impetigo contagiosa, pyoderma, seborrheic dermatitis, tinea capitis, pediculosis capitis, psoriasis in combination with 3-5% salicylic acid	For scalp, 5% ointment; for lesions of glabrous skin not exceeding 3% (See Il 38 44 47 chapter 7)
Benzoic and Salicylic *Acid Ointment* U.S.P (Whitfield' oint.)	6% benzoic acid, 3% salicylic acid polyethylene glycol ointment	Keratolytic Dermatophytosis (tinea pedis etc., superficial fungous ski infections	Strength f offical ointment should be reduced ½ to ¼ for infants and younger children (See Il 30, 31 33 35 40, 47 55 57 65 86, 88 chapter 7)
Boric Acid Ointment N.F (boracic oi t ment)	10% Finely powdered boric acid in liq id petrolatum and white ointment	Mildly antiseptic	Should be avoided in prescribing ointment for *large areas of* the skin when the epidermis is denuded and the *deeper* layers of the skin are exposed (absorption)
Chrysarobin O ntment U.S P	6% chrysarobin, chloroform, yellow ointment	Particularly useful as n antipsoriatic	Never used in full strength for children, but diluted with 5 parts of yellow ointment—leaves brownish violet stain upon skin and linens—avoid use round eyes—restrict use t localized patches (frequent rinalyses) (See Il 46, 72, 80, 92, chapte 7)
Coal Tar Ointment U.S.P	Coal tar 30 Gm., poly sorbate, zinc oxide past	Chronic stage atopic dermatitis (reducing gent) antipsoriatic	Milder concent ation tar should be used in beginning treatment (1%) Avoid use over large areas f body (frequent urinalyses) (See Il 32, 33 40 45 67 69 93 chapter 7)

TABLE 9.—Popular Ointments of Pediatric Usefulness and Importance (cont.)

Ointment	Constituents	Indications	Comments
Iodine Ointment, U.S.P.	4% iodine, 4% potassium iodide, glycerin, wool fat, yellow wax and petrolatum	Parasiticide and fungicide tinea capitis and tinea circinata	Stains skin and linens (See R 48, 83 chapter 7)
Pine Tar Ointment N.F.	50% pine tar, yellow ointment, yellow wax	Atopic dermatitis, antipsoriatic	Diluted with 4 to 5 parts of zinc oxide ointment for infants and younger children (See R 30, 40, chapter 7)
Rose water Ointment U.S.P. (cold cream)	5% rose water spermaceti, white wax, expressed oil of almond, sodium borate and distilled water (rose oil added for perfume)	A cooling cream, emollient and ointment base for other medicaments	Salicylic acid added to cold cream should be limited to 3% (See R 31, 32, 33 34 36, 39 40, 42, 43 46, chapter 7)
Scarlet Red Ointment N.F.	5% scarlet red, wool fat, olive oil, petrolatum	Epithelizing ointment	Frequent urinalyses when used on skin over prolonged time (See R 41 chapter 7)
Sulfur Ointment U.S.P.	10% precipitated sulfur, liquid petrolatum and base ointment	Scabieticidal, parasiticidal, pediculicidal, antiseborrheic	Reduce ointment for children one-half official strength, for infants one-fifth official strength (See R 45 chapter 7)
Zinc Oxide Ointment U.S.P.	20% zinc oxide, liquid petrolatum and base ointment	Protective ointment	Useful as a popular base that may be ordered when potent remedies are to be prescribed for lesions on the skin, particularly when irritation from commonly ordered remedies is to be minimized or avoided (See R 30, 31, 36, 39 41, 45, 56, chapter 7)
Ichthammol Ointment N.F.	10% ichthammol, 10% wool fat, petrolatum	Useful in subacute and chronic dermatoses e.g. atopic dermatitis, neurodermatitis and mycotic eczema	Begin treatment with ½-1% and gradually increase concentration of the shale tar. Contains sulfur (See R 30, chapter 7)
Vioform	5-chloro-7-iodo-8-hydroxy-quinoline ointment	A 3-5% in hydrophilic base or aquaphor is useful for pyoderma, infected intertrigo, tinea cruris, atopic dermatitis, fissures and seborrheic dermatitis	Vioform powder is the equivalent of iodochlorohydroxy quinoline and may be used in 1-3% ointment base (See R 43, chapter 7)
Compound Undecylenic Acid Ointment N.F.	5% undecylenic acid, 20% zinc undecylenate, polyethylene glycol ointment	Fungistatic	Undecylenic acid and undecylenate are contained in many proprietary ointments; e.g. Desenex, Timofax, Salundek (See R 50, 51, 54 chapter 7)
Compound Quinoline Ointment	0.5% Chlorohydroxyquinoline in petrolatum lanolin base	Antiseptic especially useful for treatment of pyoderma; e.g., impetigo contagiosa	Must be diluted with 3 to 4 parts of zinc oxide ointment to avoid irritation (See R 42, chapter 7)

four different types, (1) oleaginous, (2) absorbent, (3) emulsion (4) water soluble. However for purposes of therapy it is convenient to classify the bases according to their penetrability namely (1) epidermic, (2) endodermic and (3) diadermic. The first of these, as the name implies, is most useful when treating lesions that are situated superficially on the surface or outer layer of skin. The endodermic and diadermic are more useful when the lesion is located in the deeper layers of the skin, as in the case of ecthyma For use superficially the oleaginous and absorbent bases, such as petrolatum or lard, are most effective, whereas the emulsion or water soluble type of base is indicated for use in lesions where it is necessary to penetrate deeper into the epidermis, corium or subcutaneous tissues.

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The introduction of the new antibiotics, antihistamines and corticosteroids with their adaptability to ointments and creams has changed the outlook on much topical therapy Many of the older ointments and creams have been replaced by modern ointments containing wide spectrum antibiotics and corticosteroids Although some of the antihistaminic preparations used upon the

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Benzoic and Salicylic Acid Ointment U.S.P (Whitfield' oint.)	6% benzoic acid, 3% salicylic acid polyethylene glycol ointment	Keratolytic Dermatophytosis (tinea pedis etc., superficial fungous skin infections	Strength of official ointment should be reduced ½ to ¼ for infants and younger children (See ℞ 30 31 33 35 40 47 55 57 65 86, 88 chapter 7)
Boric Acid Ointment N.F (boracic ointment)	10% Finely powdered boric acid in liquid petrolatum and white *ointment*	Mildly antiseptic	Should be avoided in prescribing ointment for large areas of the skin when the epidermis is denuded and the deeper layers of the skin are exposed (absorption)
Chrysarobin Ointment U.S.P	6% chrysarobin, chloroform yellow ointment	Particularly useful as an antipsoriatic	Never used in full strength for children, but diluted with 5 parts of yellow *ointment*—leaves brownish violet stain upon skin and linens—avoid use round eyes—restrict use t localized patches (frequent ... lyses) (See ℞ 46, 72, 80, 92, chapter 7)
Coal T r Ointment U.S.P	Coal tar 30 Gm., polysorbate, zinc oxide paste	Chronic stage atopic dermatitis (reducing ... gent) ... ntipsoriatic	Milder concentration tar should be used in beginning treatment (1%) Avoid use over large ... reas of body (frequent ... analyses) (See ℞ 3.., 33 40 45 67 69 93 chapter 7)

TABLE 10.—PREPARATIONS FOR TOPICAL USE CONTAINING ANTIBIOTICS, CORTISONE DERIVATIVES AND ANTIHISTAMINICS (cont.)

	FLUOROHYDROCORTISONE OINTMENTS AND LOTIONS
Alflorone	Fluorohydrocortisone acetate 0.1% and 0.25% ointment 0.1% and 0.25% lotion
F-Cortef Acetate Ointment	0.1% or 0.2% fluorohydrocortisone
Florinef Acetate	0.1% or 0.2% in plastibase 0.05% 0.1% or 0.2% in aqueous lotion
	ANTIHISTAMINIC OINTMENTS AND CREAMS
Benadryl Cream	2% Diphenhydramine HCl in water miscible base
Histadyl Cream	2% Promethazine HCl in water-miscible base N-(2'-dimethylamino-2') thenyl) N'-(2-pyridyl)-ethylenediamine HCl
Pyribenzamine Cream	2% Tripelennamine in water-washable base
Pyribenzamine Ointment	2% Tripelennamine in petrolatum base
*Thephorin Ointment	5% Phenindamine Tartrate in Carbowax base
*Perazil Cream	1% Chlorcyclizine HCl in non-greasy base
†Phenergan Cream	2% Promethazine HCl in water-miscible base N-(2'-dimethylamino-2'-methyl) ethyl phenothiazine hydrochloride
Neohetramine Cream	2% Thonzylamine HCl in water-miscible base N,N-dimethyl-N'-p-methoxybenzyl N'-(2-pyrimidyl) ethylenediamine monohydrochloride

*Many of these chemicals or antibiotics are official in U.S.P. but not the ointments or creams for local use.
†Chemical is official in N.F. but not the cream.

ing hot humid weather and their continued use is often followed by a maceration of the skin that aggravates the dermatosis. These disadvantages are equally true with regard to the use of ointments and creams in the intertriginous regions. Accordingly shake lotions, lotions of the evaporating type and powders should be used to replace ointments under such circumstances. Ointments and creams containing potent chemicals should be employed cautiously in treating dermatoses in infants and children and their use should be restricted to localized areas of the skin. Such remedial agents may be absorbed particularly when the epidermis is abraded and exposed, into the deeper structures. The coal tars, and other tars, resorcinol, phenol, menthol and similar chemicals, so received, can produce harmful effects in the body, particularly when prescribed over long periods. Too, sensitizers, such as ethyl aminobenzoate and the other "caines," should also be avoided in the form of ointments for infants and children.

Emulsions and Creams

The terms emulsion and cream are frequently used synonymously. An emulsion is a mixture of oil and water intended for medicinal use. Cod liver oil emulsion and cow's milk are two examples. Mixtures of oil and water are made to combine by suitable emulsifying agents such as acacia, tragacanth and gelatin. Emulsions in dermatology are particularly indicated when a soothing effect for the skin is desired. They consist of combinations of oil and water, the oil being derived indifferently from the animal, vegetable or mineral kingdom. Examples of emulsions used in dermatology are:

ALUMINUM ACETATE EMULSION: BUROW'S EMULSION.—A popular emulsion, very useful in the treatment of dermatoses among infants and children, is that generally referred to as Burow's emulsion. It consists of the following formula:

℞

Wool fat U.S.P.	30.0
Olive oil	120.0
Heat in mortar and mix oil and add	
Zinc oxide	30.0
Talc	30.0

Mix very well and add 6.0 cc. solution of aluminum acetate. Mix very well and add calcium hydroxide solution to make 300 cc.

CALAMINE LINIMENT N.F. IX.—Contains zinc oxide, olive oil and calcium hydroxide

*These preparations have not been included in *The National Formulary*, 10th ed.

skin have failed to live up to expectations, particularly as antipruritics, they have, as a whole marked a step forward in the modern treatment of numerous skin disorders. Perhaps the most *spectacular remedial topical agent of recent development* is the corticosteroid prescribed in the form of ointments and creams for the management of certain skin disorders and affections of the mucous membranes of the eyes. These preparations have proved particularly helpful with many acute affections heretofore treated with little or no improvement by the orthodox ointments. Their suppressive effect in the so-called collagen diseases and their antiphlogistic effect when used topically have now placed these *remedies in a class by themselves*. This is particularly true of such a disease as atopic dermatitis when, as so often is the case, it becomes necessary to cause a *temporary remission* after many topical and internal remedies have failed to effect improvement.

Ointments as a rule are poorly tolerated dur

TABLE 10.—Preparations for Topical Use Containing Antibiotics, Cortisone Derivatives and Antihistaminics

Preparation	*Composition*
	Antibiotic Ointments
Bacitracin Ointment U.S.P	Bacitracin 500,000 U.S.P units Liquid petrolatum White petrolatum 500 U/Gm. Ointment
Neomycin Sulfate Ointment, U.S.P	Not less than 3.5 mg. neomycin base per Gm. of ointment
Terramycin Ointment	30 mg. terramycin (oxytetracycline) 10 000 Units polymyxin B Sulfate/Gm. in special petrolatum base
Aureomycin Ointment	30 mg. chlortetracycline with triethanolamine calcium chloride and carbowax/Gm.
Polymyxin B—Bacitracin Ointment	500 units bacitracin 10 000 units polymyxin B Sulfate/Gm.
	Cortisone Derivatives and Antibiotic Topical Products
Achromycin with Hydrocortisone	3% tetracycline and 2% hydrocortisone in ointment base
Terra-Cortril Topical Ointment	3% terramycin (oxytetracycline) and 1% Cortril
Neo-Cortef Acetate Ointment	5 10 or 25 mg. hydrocortisone with 5 mg. neomycin (3.5 mg. base) per Gm. Ointment
Neo-Cortef Acetate Cream	10 or 25 mg. hydrocortisone with 5 mg. neomycin sulfate per Gm. cream
Neo-Cortef Lotion	10 mg. hydrocortisone and 5 mg. neomycin sulfate per cc.
Florinef S Ointment	0.1% fluorocortisone acetate with 2.5 mg. neomycin and 0.25 mg. spectrocin (gramicidin) per Gm.
Florinef S Lotion	0.05% or 0.1% fluorocortisone with 2.5 mg. neomycin and 0.25 mg. gramicidin per cc.
Hydroderm Ointment	10 or 25 mg. hydrocortisone with 3.5 mg. neomycin base and 1000 U bacitracin per gm.
	Hydrocortisone Ointments, Creams and Lotions
Cortef Acetate Ointment	1% or 2.5% hydrocortisone
Cortril Topical Ointment	1% or 2.5% hydrocortisone
Hydrocortone Acetate (Compound F U.S.P.)	1% or 2.5% hydrocortisone Ointment 0.5 or 1% Lotion
Cort Dome	½ 1 or 2.5% hydrocortisone free alcohol in acid mantle cream base
Cortifan Cream 1%	10 mg. hydrocortisone free alcohol per Gm. in a water miscible base
Pantho-F Cream	1% hydrocortisone and 2% pantothenylol in a water miscible base
Tarcortin	0.5% hydrocortisone and 5% coal tar extract in a greaseless, stainless base

Many of these chemicals or antibiotics are official in U.S.P but not the ointments or creams for local use.

bility (2) absence of unpleasant greasy feeling, (3) greater cooling action, (4) miscibility of the bases with perspiration and serous and purulent discharge of inflamed skin, (5) more pronounced bacteriostatic and fungistatic effect by antiseptics when they are incorporated into such bases because these bases effect better contact with the surface to which they are applied and also provide a much more continuous release of the drug.

Disadvantages.—(1) Lack of tolerance for these bases often found in acute and in subacute inflammations, ( ) unsuitability of bentonite for intertriginous areas, (3) hygroscopic characteristic of the carbowaxes (especially the lower glycols of the series) contraindicates use on skins already dry

INDICATIONS FOR THE USE OF OILS AS EMOLLIENTS AND EMULSIONS (LINIMENTS) FOR TREATING DERMATOSES IN INFANTS AND CHILDREN.—A dry skin usually means that there is insufficient sebaceous secretion to lubricate it, wherefore the physician attempts to imitate nature in supplying such material or physiologic substances as are lacking. The emollient should be one which closely approximates the normal composition of the sebaceous secretion. Accordingly for this purpose animal fats and oils are generally more to be preferred than vegetable or mineral

One of the common uses for oils in infancy is as a detergent, when the use of soap and water is poorly tolerated by a sick skin. The removal of crusts, dried serum and exudate, the result of inflammation, is important as preliminary measure particularly in the treatment of impetigo contagiosa. In the latter success of the therapeutic agents prescribed (germicides and antibiotics) depends on first ridding the lesions of the crusts which serve as a protective shield to the staphylococci and streptococci responsible for the impetigo. In many instances the keratolytic effect of soap and water serves sufficiently or instead 3 per cent of salicylic acid dissolved in olive oil or liquid petrolatum may be applied to the hardened crusts by means of several layers f gauze saturated with the preparation and applied to the lesions for several hours at a time All egetable oils and mineral oils are mildly keratolytic and will soften crusts and facilitate their removal. Some of the official vegetable oils contained in the U.S.P and N.F and employed for this purpose are Olive Oil U.S.P Cottonseed Oil U.S.P Expressed Almond Oil U.S.P Linseed Oil N.F Peanut Oil U.S.P., Persic Oil U.S.P

See Formulary ℞ 68 69 70

CREAMS

Creams are mixtures of hydrous wool fat (lanolin) and water The official cold cream Rose Water ointment U.S.P (unguentum aquae rosae) while in the strictest sense not a cream, is designated by the *United States Pharmacopoeia* as a cream—cold cream. Here is another illustration of the confusion existing in the naming of preparations intended for topical use. Cold Cream U.S.P contains spermaceti, white wax, expressed oil of almond, sodium borate, rose water and distilled water scented with oil of rose. In the opinion of the writer the official cold cream is not an especially good preparation and could very well be replaced by other formulas of similar composition.

The cooling effect produced when a cream is applied to the skin is due to its high water content, which, by evaporation when applied to an inflamed skin, causes heat to be dissipated. All creams are definitely more cooling than ointments, in fact the latter frequently cause a retention of heat because of the fats which they contain.

Water washable bases and greaseless ointment bases are the same; sometimes the term "water soluble bases" is used instead. They include those bases prepared from the polyethylene glycol polymers and known as carbowaxes and carbowax compounds. The classification also includes semi-solid preparations produced through the use of bentonite, pectin, sodium *alginate* gelatin, etc.

Example of Greaseless Base

℞

Glyceryl Monostearate	10 Gm.
Glycerin	25 Gm.
Bentonite	2 Gm.
Distilled Water sufficient to make	100 Gm.

(Martin-Cook, Remington *Practice of Pharmacy*)

Persic Oil U.S.P is the adopted name for apricot kernel oil and peach kernel oil. It is an excellent emollient.

solution. Neocalamine liniment N F IX* contains prepared neocalamine, olive oil and calcium hydroxide solution. In both calamine liniment and neocalamine liniment, the calcium hydroxide solution (mild alkali) reacts with traces of free acid in the olive oil to produce a calcium soap which acts as an emulsifier

Only about 15 to 20 per cent of the olive oil present will be emulsified by the mild alkaline solution of calcium hydroxide. Calamine and neocalamine liniments are poor emulsions. They separate (break) readily upon standing for any length of time so that vigorous shaking of the preparation becomes necessary before they can be used again

ZINC CREAM (CREMOR ZINCI B P C.)—Consists of 50 Gm. of zinc oxide suspended in 50 cc of olive oil It is popular with many European dermatologists.

Both calamine liniment and neocalamine liniment are examples of water-in-oil (or "w/o") emulsions since calcium soaps produce this type.

The object of all emulsions is to get oil into the skin. Accordingly emulsions constitute one of the most useful forms of topical therapy in treating inflammatory dermatoses when the skin is erythematous, dry and irritated The combination of powder and oil serves a dual therapeutic purpose. The oil softens and lubricates the skin acting as an emollient while at the same time the powder cools the skin by causing heat to be dissipated and adds mechanical protection to the area to which it is applied.

The answer to what determines whether the preparation is an oil-in-water (o/w) emulsion or a water-in-oil (w/o) emulsion will be found in the nature of the wetting agent, which is also known as the emulsifier and stabilizer Triethanolamine has already been mentioned Official in the U.S.P it constitutes one of the finest emulsifying (wetting) agents. Other examples of stabilizers include such substances as wool fat, cholesterol and the higher alcohols (cetyl alcohol, stearyl alcohol, etc.) Dependent upon whether the oil or water is in the so-called "continuous phase, two types of emulsions are recognized In the w/o emulsion the oil is in the continuous phase and in the o/w type, the water is in the continuous phase. An example of an o/w emulsion official in the U.S.P is hydrophilic ointment (see "Ointments, this chapter) It contains white petrolatum, stearyl alcohol, polyoxyethylene 40 monostearate, propylene glycol and water In this preparation the polyoxyethylene 40 monostearate is an emulsifier and the stearyl alcohol acts as an adjuvant emulsifier and hardening agent. Propylene glycol is a humectant. This ointment is similar to the basis of many of the so-called "washable ointments found upon the market When applied to the skin the oil in the preparation is absorbed while the water evaporates, producing a sensation of softness and cooling.

Water in-oil emulsions are especially indicated when volatile chemicals such as menthol and camphor are prescribed. Other insoluble chemicals may also be used with such emulsions.

Polyhydric alcohols or alcohol esters vary in their emulsifying properties, favoring either w/o or o/w emulsions depending on their hydrophilic and hydrophobic properties. This type of emulsion produced is governed by the number of hydrophilic groups in the molecule and the length of the constituent hydrocarbon chains. For example diethylene glycol monolaurate, having hydrophobic properties, favors water-in-oil emulsion while the non-ethylene glycol esters of fatty acids are hydrophilic and favor oil-in water emulsions. Another method of conferring hydrophilic characteristics on a fatty acid ester is by the formation of polyoxyalkylene derivatives. The products known as Spans and Tweens are either oil soluble and water dispersible or water soluble depending upon the nature of their esters and the extent to which they have been treated by introduction of oxyalkylene groups. Generally the Spans are oil soluble and favor w/o emulsions the Tweens are water soluble and favor o/w emulsions. Thus by balancing the hydrophilic hydrophobic nature of the mixture, almost any two liquids will yield a homogenous mixture.

ADVANTAGES AND DISADVANTAGES OF O/W EMULSION TYPE †—*Advantages*—(1) Washa

*These preparations have not been included in *The National Formulary* 10th ed.

†Modified from Rothman S., and Shapiro, A. L. M Clin. North America, January 1949 (Chicago Number)

rub, and intertrigo Finally powders absorb excessive moisture and prevent chafing and serve as a protective coating to the skin.

Vegetable powders are generally preferred to mineral powders because they have smooth edges, whereas mineral powders examined under the microscope are seen to possess sharp irregular surfaces that may be a factor in irritating the skin when they are applied topically However starch, whether cornstarch or starch obtained from other sources, belonging to the class of polysaccharides with the general formula $(C_6H_{10}O_5)x$ has bad habits such as its ability to bind with water to cake and to irritate the skin. Furthermore starch is objectionable as a dusting powder because it affords an excellent medium for the growth of microorganisms and particularly for the monilia fungus.

Representative Prescriptions

Simple Dusting Powder

℞

Zinc oxide		
Starch	aa	8.0
Purified talc	q.s. ad	30.0

Misce et fiat pulverem
Signa Apply freely
Indication Intertrigo (erythema of groins)

Fungicidal Powder

℞

Undecylenic acid	0.6
Zinc undecylenate	6.0
Zinc stearate	2.0
Talcum q.s. ad	30.0

Misce et fiat pulverem (to be dispensed in 120.0 shaker top container)
Signa Antiseptic foot powder
Indication Prophylaxis dermatophytosis
(Andrews)

Astringent Dusting Powder

℞

Bismuth subgallate	10.0
Talcum	90.0

Misce et fiat pulverem
Signa Dusting powder (astringent)
(Lane-Levenstein)

Pediculicide Powder

℞

DDT*	5%
Talc	30.0

Misce et fiat pulverem
Signa Use as dusting powder
Indication Pediculosis corporis and pediculosis capitis

Antiseptic Dusting Powder

℞

Menthol	0.03
Thymol iodide	0.40
Zinc stearate	1.0
Magnesium carbonate	0.60
Boric acid†	4.0
Talc q.s. ad	30.0

Misce et fiat pulverem (to be dispensed in 120.0 shaker top container)
Indication Antiseptic foot powder for prophylaxis dermatophytosis (Andrews)

See Formulary ℞ 76, 77 78

Paints

A paint may be defined as an alcoholic solution containing a dye. In the strict sense of the definition, Arning's tincture, which contains a dye, anthrarobin, is really a paint. There is no objection to such a designation provided the physician understands the purpose of each preparation prescribed and the manner of its use.

There are comparatively few paints used in dermatology Most such preparations have fungicidal and bactericidal action and are employed for the treatment of dermatophytosis and secondary bacterial infections of the skin. The following formula containing dyes is popular in dermatology

Gentian Violet Paint

℞

Methylrosaniline chloride‡	5.0
Alcohol (25%)	100.0

Mix and make paint
Signa Apply to lesions by means of camel's hair brush or by means of a cotton applicator

The *United States Pharmacopoeia* recognizes a 1 per cent methylrosaniline chloride in 10 per cent alcohol and water

The disadvantage of all paints is that they stain the skin. When applied to the exposed areas of the skin they serve to label the patient as the subject of a contagious skin disorder

*This chemical, dichlor-diphenyl trichlorethane or Chlorophenothane U.S.P. is a powder (almost odorless) is also known under the names of Gesarol and Neocid

†Should be eliminated for infants and younger children

‡Methylrosaniline chloride is the adopted official title U.S.P. for gentian violet. It is also known as crystal violet and methyl violet.

In vanishing cream a soft potassium or sodium soap is formed by the reaction that ensues between the alkali (potassium or sodium hydrate) and stearic acid. As a matter of fact approximately 10 per cent of the stearic acid is emulsified by the potassium or sodium hydroxide, while the remaining free stearic acid permits saponification to proceed and the glycerin acts as a humectant.

Example f a Vani hing Cream

℞

Stearic acid	1 per cent
Glycerin	7.5 per cent
Potassium hydroxide	1 per cent
Distilled water q.s. ad	100 per cent

A greaseless ointment base is really a vanishing cream. As such it differs from cold cream, Rose Water Ointment U.S.P because it contains more water and stearic acid, which latter is the active ingredient of greaseless ointment bases (vanishing cream) As the name indicates, greaseless ointment bases are without the greasiness and messiness common to ointments Further greaseless ointment bases make excellent vehicles for drugs intended for deep as well as superficial effect on the skin

Powders

Powders used for medicinal or therapeutic purposes in dermatology are derived from the mineral and vegetable kingdoms. In addition to these sources, some other powders used topically belong to a synthetic germicides group

Classification

1 Powders derived from minerals —Titanium dioxide, zinc oxide zinc stearate, carbonates of calcium magnesium and bismuth talc (magnesium trisilicate) kaolin, silica calamine (zinc oxide and ferric oxide) cuticolor (zinc oxide and red and yellow oxide)

2. Powders derived from vegetable sources.—Cornstarch rice starch oatmeal bran lycopodium.

3 Synthetic germicides.—Zinc peroxide, vioform, sulfonamides.

Powders may be prescribed singly (e g purified talc) or in various combinations.

Function of Powders Upon the Skin

Herman Goodman of New York classifies powders according to their dominant therapeutic action

1 *Powders employed for cover* (i.e. concealment) —Neocalamine and Neutracolor are examples.

2 *Powders used for adherence* —Examples are metallic soaps, such as magnesium and zinc salts of the fatty acids, magnesium oleate, zinc stearate, zinc oleate.

3 *Powders used for slip* —Slip offers an even distribution of the powder Examples are talc and metallic soaps such as zinc stearate.

4 *Powders used to provide bulk* —All of the heavy powders are bulky Carbonates of zinc magnesium and calcium are examples.

It is customary to use a fine dusting powder upon the baby's skin to complete the daily bath. Powder when so used should be nonirritating, of the finest quality and without grittiness. Only unscented talc powder should be used. Baby powder should preferably be sterilized by heat in order to avoid the possibility of bacterial spore contamination. Caution should be taken to avoid the child's inhaling the powders (especially those containing zinc stearate) Accordingly cans of talcum powder should never be given to infants for amusement as toys. Instances of bronchopneumonia have been reported caused by the inhaling of powders containing zinc stearate.

Powders are used to absorb serous discharges, moisture and exudate and to help keep the skin dry Powders prescribed either singly or in combination with other remedies are soothing and cooling when applied to a dry and highly irritated skin. Powders act by causing an increase of heat radiation resulting from the large area covered, thereby congestion is relieved. Powders absorb edematous fluid and in this respect are similar in their action to pastes. Also they are useful in the management of dermatophytosis. The keratolytic effect produced by substances such as undecylenic acid salicylic acid and benzoic acid renders powders valuable as fungicidal remedies. They are also useful for treating such conditions as hyperhidrosis mili-

in contrast to tinctures, are applied over large areas of the skin. Lotions differ from paints in that they are aqueous preparations and are indicated for still more extensive lesions.

Whitfield's Tincture (unofficial) contains the same ingredients as does Whitfield's Ointment, Benzoic and Salicylic Acid Ointment N.F. IX (Unguentum Acidi Benzoici et Salicylici) namely 12 per cent of benzoic acid and 6 per cent of salicylic acid; but alcohol is used as the vehicle, *instead of petrolatum as the base for the ointment*. This remedy is especially useful for the treatment of dermatophytosis—so-called athlete's foot. For children, milder concentrations should be prescribed at first because it is strongly keratolytic. Three concentrations of Whitfield's Tincture are recognized

	(1)	(2)	(3)
Benzoic acid	12%	6%	3%
Salicylic acid	6%	3%	1.5%
Alcohol U.S.P	100.0 cc	100.0 cc	100.0 cc

At the beginning of treatment, the mildest dilution (3) should be used. This strength under certain conditions may be increased to the second formula for older children.

Whitfield's Tincture

℞
Salicylic acid	1.8
Benzoic acid	3.6
Alcohol (70%) q. s. ad	60.0

Misce et fiat
Signa Apply by means of cotton applicator or camel's hair brush
Indication Epidermophytosis

Benzoin Tincture U.S.P (Tinctura Benzoini) —Made from 20 per cent benzoin in moderately coarse powder and alcohol. Is useful in the treatment of aphthous ulcers, stomatitis and for the fissured lesions seen in perlèche.

℞
Podophyllin (10%)	3.0
Benzoin tincture	30.0

Misce et fiat
Signa To be applied by means of cotton applicator or camel's hair brush
Indication Condyloma acuminata (rare in children) Also for arts

The present official formula for Whitfield Ointment, Benzoic and Salicylic Acid Ointment U.S.P XV, calls for 6 per cent of benzoic acid and 3 per cent of salicylic acid in a base of polyethylene glycol ointment.

Iodine Tincture U.S.P (Tinctura Iodi) 2 per cent —Commonly used as a topical application for treating isolated lesions of tinea circinata upon the glabrous skin, for the animal type of tinea capitis (microsporum lanosum) and for small restricted lesions *of impetigo contagiosa*. This tincture has replaced the stronger tincture Strong Tincture of Iodine (Tinctura Iodi Fortis N.F IX†) 7 per cent, which was formerly contained in the U.S.P

Tincture of Coal Tar

℞
Crude coal tar	1.5
Chloroform q. s. ad	30.0

Misce et fiat
Signa Apply by means of a camel's hair brush
Indication Atopic dermatitis

See Formulary ℞ 79, 80, 81, 82, 83, 84

Plasters

Plasters have limited field of usefulness in treating skin disorders in children. Their use has largely been replaced by more efficient therapeutic methods, even for adults. The purpose of a plaster is to afford protection and give mechanical support to the part to which it is applied, or to serve as an occlusive dressing, and by its macerating action to bring medication into close contact with the area of the skin treated. In removing plaster solvents such as alcohol, *ether benzin or acetone may be used*. A corner of the plaster is raised and the solvent is applied by means of a sponge or piece of cotton soaked with the preparation. The solvent is allowed to trickle between the skin and the plaster I this manner the plaster will at once release its hold and is easily removed without pulling the skin.

Cantharides Plaster N.F. VII† is no longer official. Its usefulness is *raising bullae for scientific research* when such lesions are desired. Cantharides Plaster was at one time used as a counterirritant. It is now obsolete for this purpose. It is made by spreading Cantharides Cerate evenly upon adhesive plaster or other suitable material.

† This preparation has been deleted from the N.F Ed X.

Certainly most mothers know that the child who bears the earmarks of gentian violet upon his face or hands has impetigo contagiosa

Castellani Paint (Carbol-Fuchsin Solution N.F. XV)

℞

Saturated alcoholic solution of basic fuchsin	100.0 cc.
Aqueous solution of phenol (5%)	1000.0 cc.
Filter and add boric acid to the filtrate	10 Gm.
Allow to stand for hours and then add acetone	50 Gm.
Again allow to stand for 2 hours and then add resorcinol	100 Gm.

This preparation should be stored in amber colored bottles. Castellani's paint is useful in the treatment of tinea especially in those instances where iodine has failed of ringworm of the feet (and if vesicles are present these should first be punctured and the paint applied twice daily) and of mycotic nails. Castellani's paint sometimes relieves the local discomfort in severe cases of the aphthous stomatitis frequently seen in children A 1 4000 solution of neutral acriflavine is useful in the treatment of dermatitis venenata Although according to the *United States Dispensatory* (25th Ed) acriflavine is not an extremely powerful bactericide, it is a very active bacteriostatic substance and useful in the treatment of dermatoses caused by pyogenic bacteria.

Dymixal is a mixture of three dyes containing crystal violet 46 per cent brilliant green 31 per cent, and acriflavine 23 per cent. It may be prepared by the mechanical mixing of the three dyes in their solid state. Dymixal appears to be more advantageous than any single dye in its antiseptic effect against gram-positive and gram negative bacteria. It is used as a 2.6 per cent aqueous solution. Brilliant green in a 1 1000 solution is a remedy that has been found satisfactory for the treatment of aphthous stomatitis and for the oral lesions of erythema multiforme bullosa

Representative Prescriptions

Crude Coal Tar Paint

℞

Acetone	4.0
Collodion	4.0
Crude coal tar q.s. ad	30.0

Misce et fiat

Signa Allow to dry after applying by means of a camel's hair brush. Dust with purified talc

Indication Atopic dermatitis

Keratolytic Paint

℞

Scarlet red	0.15
Salicylic acid	3.0
Alcohol	30.0

Misce et fiat

Signa Apply by means of cotton applicator or a camel's hair brush

Indication Verruca, corns, callosities

See Formulary ℞ 71 72, 73 74

Tinctures

In a strictly pharmaceutic definition, the term "tincture" means an alcoholic preparation containing a medical substance. The official tinctures contain either 10 per cent or 20 per cent of the substance in strong ethyl alcohol. Thus, the official Tincture of Digitalis U.S.P. is a 10 per cent alcoholic preparation of digitalis. Again Benzoin Tincture U.S.P. contains 20 per cent of benzoin in ethyl alcohol However in dermatology the term "tincture connotes merely that the vehicle used is volatile and the vehicle may be chloroform ether acetone carbon tetrachloride or alcohol *Arning's tincture* used by many dermatologists as a fungicide in the treatment of dermatophytosis, affords an example It consists of anthrarobin tumenol ammonium glycerin and spirit of ether When used in full strength it is entirely too strong Accordingly Arning's tincture should be diluted before it is applied to children's skin.

Modified Arning Tincture

℞

Anthrarobin	1.0
Tumenol	2.0
Glycerin	2.0
Alcohol U.S.P.	
Ether—of each sufficient quantity to make	30.0

This preparation should be used carefully even when applied to the skin in the strength given in the modified formula. Tinctures are applied to small restricted areas of the skin generally by means of a glass rod. On the other hand paints,

Dymixal is no longer available *See Formulary* ℞ 74 which is the equivalent

2. ZINC GELATIN BANDAGE OR UNNA'S ZINC GEL PASTE.—Like the plaster of paris cast, the zinc gelatin bandage is applicable in treating dermatoses in adults (stasis dermatitis, varicose veins and varicose ulcers, hemostatic eczema) but is seldom if ever indicated in the dermatoses seen in children. The following is a formula for Unna's Zinc Gel Paste:

Zinc oxide	100. Gm.
Gelatin	200. Gm.
Glycerin	300. Gm.
Water	400. Gm.

The preparation is placed in hot water (a water bath) before it is used in order to liquefy it. It is then applied in a lukewarm state with a brush. When half dry it is fixed with a gauze bandage and may be allowed to remain on the skin for several days. It is useful in chronic eczema. The preparation is the equivalent of Firm Glycerogelatin N.F.V.

There are a number of commercial products designed as substitutes for the zinc gelatin bandage of Unna. Among such preparations may be mentioned Gelo-Cast and Elastoplast bandage. Glycerogelatins composed of gelatin, glycerin, water, and a medicament for topical application are practically never employed in present day practice of dermatology, and such preparations have been deleted from *The National Formulary*.

COLLODION

Collodion is official in the *United States Pharmacopoeia*. It consists of pyroxylin (gun cotton), ethyl oxide (ether), and alcohol. The *United States Pharmacopoeia* states that collodion should contain not less than 5 per cent of pyroxylin. As a result it is highly inflammable. In form it is a clear syrupy liquid smelling strongly of ether. Any medicinal agent dissolved in collodion is therapeutically much weaker than when incorporated in an ointment. Therefore collodions have limited usefulness in the practice of pediatric dermatology. Still, 3 to 5 per cent of methylrosaniline chloride (gentian violet) in collodion is at times useful when applied to localized lesions of impetigo contagiosa because the collodion gentian violet serves to prevent the lesions from spreading to adjacent, uninvolved areas of the skin. Salicylic acid in strength of 10, 15, or 20 per cent, added to collodion, is useful for the treatment of corns and for verruca vulgaris. A third indication for medicated collodion is the treatment of isolated patches of psoriasis and psoriatic nails. The strength of the chrysarobin should be at least 10 per cent. Care should be taken, however, to avoid its use upon the face. Happily, psoriatic plaques are seldom encountered in younger children. In addition to Collodion U.S.P., the *United States Pharmacopoeia* also recognizes a Flexible Collodion which contains 2 per cent camphor and 3 per cent castor oil dissolved in collodion. Salicylic Acid Collodion (Collodium Acidi Salicylici U.S.P.) contains 10 per cent of salicylic acid in flexible collodion. Other collodions such as styptic collodion, cantharides collodion, and ichthammol collodion are of little practical importance in dermatology.

Representative Prescriptions

℞
Methylrosaniline chloride (3%) 0.9
Collodion 30.0
Misce et fiat collodium
Signa: Apply with camel' hair brush 3 times daily
Indication: Impetigo contagiosa

℞
Salicylic acid (10%) 3.0
Collodion 30.0
Misce et fiat collodium
Signa: Apply nightly to corn or callous
Indication: Corn remover

See Formulary ℞ 90, 91, 92, 93

Caustic and Sclerosing Agents

Caustic and sclerosing agents, which are employed for the purpose of destroying tissue, are not nearly so important in treating children as they are for adults. In fact, except for lunar caustic (Toughened Silver Nitrate U.S.P.) employed for cauterizing granulating wounds and in umbilical granuloma, and Trichloroacetic Acid U.S.P. occasionally used for the treating of verruca, there is seldom any use for cauterizing agents with children. Dry ice is valuable in the treatment of certain types of birthmarks but its application should not be undertaken by the inexperienced pediatrician. The writer has not found any great difference among the mono-

Salicylic Acid Plaster is unofficial It is marketed in three strengths 10 per cent, 20 per cent and 40 per cent of salicylic acid. Salicylic acid plaster may be used for removing corns and smaller callosities The 40 per cent plaster is useful in treating plantar warts

Lead Oleate Plaster N.F VIII has been found useful for softening hyperkeratotic lesions

Jellies (Gels)

Jellies are much like mucilages, having a jelly like consistency owing to their preparation by the mixture of glycerin with tragacanth gum acacia or gelatin. Glycerite of starch too, is useful when grease is contraindicated Indeed it makes an excellent application to soften and remove crusts for example, in the treatment of impetigo contagiosa when it is necessary to get rid of the hardened crusts before applying a germicide Goldsmith states that jellies are especially suitable for administering germicides, fungicides mercurials and astringents.

Glycerite of Starch U.S.P which contains 10 per cent of starch glycerin, water and 0 2 per cent of benzoic acid and which makes an excellent substitute for fatty ointment vehicles is believed to penetrate into the deeper structures of the skin. Glycerite of starch enters into the composition of the popular *Ruggle s cream* a non greasy cream serving as a satisfactory base for many chemicals. In the preparation of the cream the great essential is the employment of a perfect glycerite of starch, which must be brought to the same temperature as the other ingredients when batches are mixed Because the cream has a tendency to dry on standing, large quantities should not be made up The following is a formula for Ruggle s cream

Powdered stearic acid (Merck)	75.0 Gm
Potassium carbonat	15 0 Gm.
W ter	320.0 Gm.
Powdered borax	5 0 Gm.
Quince jelly	75 0 Gm.
W ter	100 0 Gm
Zinc oxide	10 0 Gm.
Glycerite of starch	400.0 Gm.

From A Compilation of Ointment nd Ointment like Bases (revised) 1949 by L. W Schleuse and E A. Burrows, Texas Pharmacal Company

The specific directions for preparing this cream can be carried out by any skilled pharmacist Rothman and Henningsen found Ruggle s cream a suitable base for para-aminobenzoic acid as a protection against the sunburn range of ultraviolet light They state that it has the advantage of being nonirritating, nonsoiling and relatively stable under solar radiation. Their experiments were made with a 15 per cent para-aminobenzoic in Ruggle s cream. Interesting is the fact that the preparation containing para aminobenzoic acid when applied to the skin in 0 003 mm layer thickness, was found to protect areas covered 50 to 100 times longer against developing a threshold erythema than areas protected symmetrically only with the plain vehicle

The pectins have recently come to play an important part in dermatologic therapeutics as emulsifying agents. Pectin is a mucilaginous substance obtained from citrus fruits or apple pomace When a pectin is used as an emulsifying agent the highest grade of pectin should be employed, one free from adulteration An investigation by Haynes *et al* showed that wounds treated with pectin showed a marked decrease or complete disappearance of the streptococci and staphylococci and the authors said that this decrease was more than likely attributable to pectin.

Fixed Dressings and Collodion Dressings

Fixed Dressings

Fixed dressings are dressings applied to the skin with the object of keeping them on the skin for some time They are used in two forms

1 Plaster cast† —This is seldom needed in children but in adults it is valuable when the dermatologist suspects that a dermatitis is self induced (dermatitis factitia) A plaster of paris cast applied over the lesions will clear up the self induced ulcerations since the patient cannot get to the area that is tightly sealed

†Plaster of paris consists of fine white powder th t is ery soluble in wate Chemically it is exsiccated calcium sulfat (C SO ½ H_2O) When pl ster of paris is mixed with half of it eight f w ter it forms smooth paste which rapidly hardens. It is used making plaster f paris bandages.

— ZINC GELATIN BANDAGE OR UNNA'S ZINC GEL PASTE.—Like the plaster of paris cast, the zinc gelatin bandage is applicable in treating dermatoses in adults (stasis dermatitis, varicose eczema and varicose ulcers, hemostatic eczema) but is seldom if ever indicated in the dermatoses seen in children. The following is a formula for Unna's Zinc Gel Paste

Zinc oxide	100. Gm.
Gelatin	200. Gm.
Glycerin	300. Gm.
Water	400. Gm.

The preparation is placed in hot water (a water bath) before it is used in order to liquefy it. It is then applied in a lukewarm state with a brush. When half dry it is fixed with a gauze bandage and may be allowed to remain on the skin for several days. It is useful in chronic eczema. The preparation is the equivalent of Firm Glycerogelatin N F V

There are a number of commercial products designed as substitutes for the zinc gelatin bandage of Unna. Among such preparations may be mentioned Gelo-Cast and Elastoplast bandage. Glycerogelatins composed of gelatin, glycerin, water and medicament for topical application are practically never employed in present day practice of dermatology and such preparations have been deleted from *The National Formulary*

COLLODION

Collodion is official in the *United States Pharmacopoeia* It consists of pyroxylin (gun cotton) ethyl oxide (ether) and alcohol The *United States Pharmacopoeia* states that collodion should contain not less than 5 per cent of pyroxylin as a result it is highly inflammable. In form it is a clear syrupy liquid smelling strongly of ether Any medicinal agent dissolved in collodion is therapeutically much weaker than when incorporated in an ointment. Therefore collodions have limited usefulness in the practice of pediatric dermatology Still, 3 to 5 per cent of methylrosaniline chloride (gentian violet) in collodion is at times useful when applied to localized lesions of impetigo contagiosa because the collodion gentian violet serves to prevent the lesions from spreading to adjacent, uninvolved areas of the skin. Salicylic acid in strength of 10 15 or 20 per cent, added to collodion, is useful for the treatment of corns and for verruca vulgaris. A third indication for medicated collodion is the treatment of isolated patches of psoriasis and psoriatic nails. The strength of the chrysarobin should be at least 10 per cent. Care should be taken, however to avoid its use upon the face. Happily psoriatic plaques are seldom encountered in younger children. In addition to Collodion U.S.P the *United States Pharmacopoeia* also recognizes a Flexible Collodion which contains 2 per cent camphor and 3 per cent castor oil dissolved in collodion. Salicylic Acid Collodion (Collodium Acid Salicylici U.S.P) contains 10 per cent of salicylic acid in flexible collodion. Other collodions such as styptic collodion, cantharides collodion and ichthammol collodion are of little practical importance in dermatology

Representative Prescriptions

℞
Methylrosaniline chloride (3%)	0.9
Collodion	30.0

Misce et fiat collodium
Signa: Apply with camel' hair brush 3 times daily
Indication: Impetigo contagiosa

℞
Salicylic acid (10%)	3 0
Collodion	30 0

Misce et fiat collodium
Signa Apply nightly to corn or callous
Indication Corn remover

See Formulary ℞ 90, 91 92, 93

Caustic and Sclerosing Agents

Caustic and sclerosing agents, which are employed for the purpose of destroying tissue, are not nearly so important in treating children as they are for adults. In fact, except for lunar caustic (Toughened Silver Nitrate U.S.P) employed for cauterizing granulating wounds and in umbilical granuloma, and Trichloroacetic Acid U.S.P occasionally used for the treating of verruca, there is seldom any use for cauterizing agents with children. Dry ice is valuable in the treatment of certain types of birthmarks but its application should not be undertaken by the inexperienced pediatrician. The writer has not found any great difference among the mono-

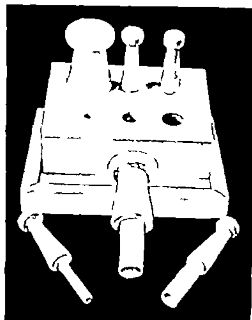


Fig. 9.—An efficient mold for making sticks of carbon dioxide snow ¼ to 1½ in. in diameter from carbon dioxide gas. (Courtesy of H C. Rutter Pittsburgh.)

The following dermatologic entities are treated satisfactorily by means of carbon dioxide snow

ANGIOMAS —*Spider nevus (nevus auraneus)* —One or two treatments usually are sufficient *to cause the lesion to disappear* —*Time 5 to 10* seconds with moderate pressure

Strawberry hemangioma —One or more treatments at weekly intervals or every two weeks. Time 5 to 10 seconds with moderate pressure.

Cavernous angioma (less than 2 cm) —Time 5 to 10 seconds with heavy pressure.

LUPUS ERYTHEMATOSUS (DISCOID LESIONS) —On the face in older children. Time 10 to 20 seconds with medium pressure.

MOLLUSCUM CONTAGIOSUM —*When the lesions are not too numerous.* Time 15 to 20 seconds with heavy pressure.

NEVI —The hairy papillary verruciform or mouse skin types are safely and readily amenable to treatment with carbon dioxide snow Treatment should be begun at 5 to 10 seconds with light pressure and repeated at weekly intervals if necessary The superficial type of nevus, the so-called "ectodermal nevus (accompanied by pigmentation) also responds to this type of treatment.

At the Atlantic Dermatological Conference held in New York in March 1956 Dr George C Andrews presented several reports of cases of hairy pigmented nevi in infants all of whom had been treated successfully by means of carbon dioxide snow A piece of dry ice approximately 2 in square was placed over the nevus for a period of 10 to 20 seconds using fairly firm pressure. Later the treatment period was increased to 30 seconds at each visit. Th treatment was carried out at two-week intervals and continued for several years. (In some instances the intervals between treatment were increased to three instead of two weeks.) The *end results were excellent.* Electrolysis was used to remove the hairs. According to Andrews, there were no failures with such modality of therapy and there is no danger of scars.

VERRUCAE.—*The common flat type of wart* —May be treated by carbon dioxide snow Time 30 to 60 seconds with heavy pressure.

Plantar wart —These should first be pared down with a knife or treated by means of 40 per cent salicylic acid plaster before the dry ice is applied Time 45 to 90 seconds with heavy pressure.

XANTHOMAS AROUND THE EYE AND ELSEWHERE.—Time 5 to 10 seconds with moderate pressure.

ACNE VULGARIS —When prepared as a slush with sulfur and acetone.

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7

Formulary

Wet Dressings
(Solutions)

℞ 1

Sodium thiosulfate 240.0

Signa: Thoroughly dissolve 1 tablespoonful in 2 qt. of hot water. Cool. (Ice cold applications should be restricted to localized areas of the skin.)

Indications. Mild astringent. Mild fungicide. May be used as soak or wet dressing once or twice daily. Prophylaxis and treatment of superficial fungous infections—dermatophytoses, tinea pedis, tinea versicolor.

℞ 2

Boric acid 120.0

Dispense in suitable box or wide-mouthed bottle.

Signa: Add 1 level tablespoonful to 1 qt. hot water. Dissolve and cool. Apply upon several thicknesses of linen or one Turkish towel, continuously kept wet. Frequent applications for at least ½ hour at a time.

Indications. Mild antiseptic and fungicide for tinea pedis.

CAUTION: Avoid use over large exudative areas of the skin in infants and younger children (Poisoning!)

℞ 3

Tablets potassium permanganate 0.3

Mitte tales No. XXIV

Signa: Crush thoroughly and dissolve 1 tablet containing 0.3 Gm. of the chemical in 3 qt. hot water. Cool. (This makes approximately 1:10,000 solution.) Use as wet dressing.

Indications. Bactericidal, oxidizing and astringent for pyoderma, dermatoses complicated by secondary infection (e.g. atopic dermatitis). Used as wet dressing, bath for generalized lesions, or as soak.

℞ 4

Silver nitrate (2.5%) 0.6–1.5

Distilled water 30.0

Misce et fiat

Signa: Apply by means of cotton applicator once or twice daily.

Indication. Germicide and astringent especially for infections, fissures and ulcers of the mucous membranes, e.g. thrush, aphthous stomatitis, perlèche, impetigo contagiosa neonatorum, granuloma pyogenicum. Also used to destroy excessive granulation tissue (granuloma pyogenicum) and for granuloma of the umbilical cord.

℞ 5

Aluminum acetate (Burow's) solution 240.0

Signa: Apply as a continuous wet dressing. For older children add 4 tablespoonfuls to 20 oz. water (1 10); for younger children add [illegible] tablespoonfuls to 20 oz. water (1.20); for infants add 2 tablespoonfuls to 30 oz. water (1.30).

Indications. Astringent, antiseptic. An excellent preparation for use as a wet dressing in any acute exudative dermatosis, e.g. atopic dermatitis.

℞ 6

Sulfurated lime solution N.F. 120.0

(Vleminckx' solution, Vleminckx' lotion)

Signa: Add 1 to 2 teaspoonfuls to glass of hot water. May be increased to 1 tablespoonful to glass of hot water. Apply as hot application for 10 to 20 minutes at a time once daily. This preparation must be freshly prepared accordingly. It should not be ordered in large quantities.

Indications: When effect of sulfides and polysulfides is desired. Keratolytic for acne vulgaris, pyoderma (as continuous hot wet packs).

CAUTION: Tarnishes jewelry.

Antibiotic Solution

℞ 7

Neomycin		0 03
Distilled water	q.s. ad	30.0

Misce et fiat

Signa. Apply several times daily

Indications: As topical application in the local treatment or prevention of infections of the skin and eye caused by susceptible organisms, e.g., pyogenic or secondarily infected impetigo, wounds, burns, conjunctivitis, blepharitis and stye

Baths

℞ 8

Sulfurated potash N.F	1,000.0

Signa. Dissolve 1 oz. in a tub of warm water

Indications: Keratolytic in psoriasis, ichthyosis vulgaris, keratosis palmaris et plantaris; parasiticidal in scabies, ringworm, tinea versicolor May be prescribed as a lotion 1 5% for acne or as an ointment in same strength

℞ 9

Potassium permanganate	30 0

Signa. Thoroughly dissolve 1 sparse teaspoonful (4.8 Gm.) in tub (30 gal.) of water This makes approximately a 1 25 000 solution

Indications: Bactericidal, oxidizant nd astringent in pyodermas, dermatoses complicated by secondary infection e.g., atopic dermatitis etc. Used as a wet dressing, a bath for generalized lesions, and as a soak

For other types of baths see Chapter 6

Lotions

℞ 10

Calamine lotion U.S.P	90 0-180 0

Signa Apply p.r.n.

Indications Same as zinc oxide, protective Because of pink color may be used to camouflage skin for various dermatoses of the face. (The U.S.P recognizes Calamine Lotion with 1% phenol for its antipruritic effect)

℞ 11

Phenol (1%)		1.8
Menthol (0.25%)		0.4
Glycerin		8.0
Alcohol (70%) U.S.P	q.s. ad	180.0

Misce et fiat

Signa Apply locally p.r.n.

Indications: Antipruritic lotion for treatment of various dermatoses accompanied by itching; e.g following bites and stings of insects, urticaria

℞ 12

Spirit of camphor		10 0
Alcohol U.S.P		10 0
Tragacanth		1.5
Precipitated sulfur		6 0
Distilled water	q.s. ad	100 0

Misce et fiat

Signa. Apply to lesions before retiring.

Indications: Local stimulant and astringent for acne vulgaris

℞ 13

Precipitated sulfur		
Sodium borate	aa	4.0
Acetone		30 0
Spirit of camphor		120.0

Misce et fiat

Signa. Apply before retiring

Indications: Local stimulant and cleansing lotion for acne vulgaris

℞ 14

Salicylic acid		8.0
Resorcinol		4.0
Zinc sulfocarbolate		15.0
Coal tar solution		15.0
Glycerin		15.0
Alcohol U.S.P		
Distilled water	aa q.s. ad	40.0

Misce et fiat

Signa. Apply one to two dropperfuls upon different areas of the scalp before retiring. To be rubbed thoroughly into the scalp after each application

Indications Counterirritant, keratolytic for dry type of seborrheic dermatitis scalp

℞ 15

Resorcinol	5.2
Precipitated sulfur	20 0
Zinc oxide	45 0
Talc	45.0
Glycerin	4 0
Alcohol U.S P	
Calcium hydroxide solution aa q.s. ad	240 0

Misce et fiat

Signa "Shake well label. Apply several times daily

Indication. A simple shake lotion possessing mild antipruritic and keratolytic effect. Useful for ch onic topic dermatitis nd psoriasis

℞ 16

White lotion (lotio alba) U.S.P (double official strength)	120 0

(The U.S.P preparation contains 4% sulfurated potash, 4% zinc sulfate and distilled water to make 100 cc.)

S gna. Apply to lesions before retiring nightly This preparation must be freshly prepared accordingly it should not be ordered in large quantities

Indication. Local stimulant, keratolytic, for acne vulgaris

℞ 17

Resorcinol (3.5%)	8.0
Betanaphthol	0.32 0
Bichloride mercury	0.13
Alcohol	90 0

Distilled water q.s. ad 40.0
Misce et fiat
Signa: Apply to scalp with considerable friction before retiring
Indication: Local stimulant and antipruritic in seborrhea sicca, alopecia

℞ 18
Castor oil 8.0-15.0
Alcohol (70%) 120.0
Misce et fiat
Signa: Apply to scalp with considerable friction before retiring
Indication. Antiseborrheic in dry type seborrhea of the scalp

℞ 19
Dalibour water (modified dalibour solution)
Copper sulfate 0.6
Zinc sulfate 2.0
Camphor water q.s. ad 100.0
Misce et fiat
Signa: Add one teaspoonful to 2 glasses of water. Apply as wet dressing three times daily. If the above dilution causes irritation or burning sensation of the skin, it should be diluted further with water before it is applied topically
Indication: Powerful astringent and germicide for pyoderma, herpes simplex, herpes zoster, pediculosis

℞ 20
Neomycin (0.5%) 0.6
Calamine lotion q.s. ad 120.0
Misce et fiat
Signa. Apply several times daily
Indication. As topical application in the local treatment and prevention of susceptible infections of the skin

℞ 21
Aluminum acetate solution 30.0
Zinc oxide
Talc aa 60.0
Glycerin 45.0
Calcium hydroxide solution q.s. ad 240.0
Misce et fiat
Signa: Frequent applications as indicated
Indication. Astringent, antiphlogistic, for exudative dermatoses, e.g., atopic dermatitis and other eczematized lesions (Burow's lotion)

℞ 22
Menthol (2%) 0
Phenol (2%) 2.0
Salicylic acid (1%) 1.0
Alcohol 100.0
Misce et fiat
Signa. To be dabbed upon the skin
Indication. Antipruritic lotion for stings and bites of insects (Kleinschmidt-Greenwald)

℞ 23
Phenol (0.25%) 0.3
Menthol (0.1%) 0.12
Thymol iodide 4.0
Magnesium carbonate 12.0
Camphor water 15.0
Hamamelis water q.s. ad 120.0
Misce et fiat
Signa. Apply every 4 hours. If too strong dilute with an equal quantity of witch hazel water. Precede by wet dressings
Indication. Astringent, antipruritic lotion for dermatitis venenata (poison ivy, sumac and oak)

℞ 24
Hexachlorophene (0.5%) 0.5
Boric acid (But cautiously in infants and younger children.) 3.0
Diluted alcohol q.s. ad 100.0
Misce et fiat
Signa: Apply freely
Indication. Antiseptic germicidal lotion especially of value in the prevention of miliaria, periporitis staphylogenes

℞ 25
Zinc oxide 30.0
Talc 30.0
Glycerin 10.0
Witch hazel water q.s. ad 180.0
Misce et fiat
Signa: Apply freely
Indication. A simple mildly astringent shake lotion for nonexudative dermatoses

℞ 26
Zinc oxide 30.0
Talc 30.0
Bentonite 4.0
Witch hazel water 30.0
Calcium hydroxide solution q.s. ad 180.0
Misce et fiat
Signa. Frequent applications. "Shake well" label. (Coal tar solution [liquor carbonis detergens or phenol] 0.5% may be added for antipruritic effect)
Indication. A simple shake lotion of the evaporating type for acute dermatoses, miliaria, etc.

℞ 27
Saturated solution boric acid
Witch hazel water aa q.s. ad 500.0
Misce et fiat
Signa: Frequent applications
Indication. Antiphlogistic, evaporating lotion for prophylaxis and treatment of miliaria
CAUTION: Avoid use over extensive inflamed areas of skin in infants and younger children because of danger of absorption

℞ 28
Mercury bichloride 0.13
Glacial acetic acid 1.2
Fluidextract larkspur 16.0
Distilled water q.s. 120.0
Misce et fiat
Signa: Apply at night. Cover scalp with boxen cap
Indication. Pediculicidal and ovicidal lotion for the treatment of pediculosis capitis

Antibiotic Solution

℞ 7

Neomycin		0.03
Distilled water	q s. ad	30 0

Misce et fiat

Signa. Apply several times daily

Indications: As topical application in the local treatment or prevention of infections of the skin and eye caused by susceptible organisms e.g., pyogenic or secondarily infected impetigo, wounds, burns, conjunctivitis, blepharitis and stye

Baths

℞ 8

Sulfurated potash N.F 1 000.0

Signa. Dissolve 1 oz. in a tub of warm water

Indications. Keratolytic in psoriasis, ichthyosis vulgaris, keratosis palmaris et plantaris; parasiticidal in scabies, ringworm, tinea versicolo May be prescribed as a lotion 1 5% for acne or as an ointment in same strength

℞ 9

Potassium permanganate 30.0

Signa. Thoroughly dissolve 1 sparse teaspoonful (4 8 Gm.) in tub (30 gal.) of water Thi makes approximately a 1 25,000 solution

Indications Bactericidal, oxidizant and astringent in pyodermas, dermatoses complicated by secondary infection, e.g atopic dermatitis etc. Used as a wet dressing, a bath for generalized lesions, and as a soak

For other types of baths see Chapter 6

Lotions

℞ 10

Calamine lotion U.S P 90.0-180 0

Signa. Apply p.r.n.

Indications. Same as zinc oxide, protective Because of pink color may be used to camouflage skin for various dermatoses of the face. (The U.S.P recognizes Calamine Lotion with 1% phenol for its antipruritic effect)

℞ 11

Phenol (1%)		1.8
Menthol (0.25%)		0.4
Glycerin		8.0
Alcohol (70%) U.S.P	q s. ad	180.0

Misce et fiat

Signa. Apply locally p.r.n.

Indications: Antipruritic lotion for treatment f various dermatoses accompanied by itching, e.g., following bites and stings of insects, urticaria

℞ 12

Spirit of camphor		10 0
Alcohol U.S.P		10.0
Tragacanth		1.5
Precipitated sulfur		6.0
Distilled water	q s. ad	100.0

Misce et fiat

Signa. Apply to lesions before retiring.

Indications Local stimulant and astringent for acne vulgaris

℞ 13

Precipitated sulfur		
Sodium borate	aa	4 0
Acetone		30 0
Spirit of camphor		120 0

Misce et fiat

Signa. Apply before retiring

Indications Local stimulant and cleansing lotion for acne vulgaris

℞ 14

Salicylic acid		8.0
Resorcinol		4.0
Zinc sulfocarbolate		15.0
Coal tar solution		15.0
Glycerin		15.0
Alcohol U.S.P		
Distilled water	aa q s. ad	240.0

Misce et fiat

Signa. Apply one to two dropperfuls upon different areas of the scalp before retiring. To be rubbed thoroughly into the scalp after each application

Indications Counterirritant, keratolytic for dry type of seborrheic dermatitis scalp

℞ 15

Resorcinol		5.2
Precipitated sulfur		20.0
Zinc oxide		45 0
Talc		45.0
Glycerin		24.0
Alcohol U.S P		
Calcium hydroxide solution	a q s. ad	240.0

Misce et fiat

Signa. "Shake well" label. Apply several times daily

Indication. A simple shake lotion possessing mild antipruritic and keratolytic effect. Useful for chronic topic dermatitis nd psoriasis

℞ 16

White lotion (lotio alba) U.S P (double official strength) 120 0

(The U.S.P preparation contains 4% sulfurated potash, 4% zinc sulfate and distilled water t make 100 cc.)

Signa Apply to lesions before retiring nightly This preparation must be freshly prepared, accordingly it should not be ordered in large quantities

Indication. Local stimulant, keratolytic, for acne vulgaris

℞ 17

Resorcinol (3.5%)	8.0
Betanaphthol	0.32 2.0
Bichloride mercury	0 13
Alcohol	90 0

℞ 41

Scarlet red (1-2%)	0.6-1.2
Hydrophilic petrolatum	
Zinc oxide ointment aa q.s. ad	60.0

Misce et fiat

Signa: Apply several times daily. Bandage

Indication: Epithelizing type of ointment for the treatment of chronic ulcers (sickle cell anemia), unhealthy granulomatous ulcerative lesions, ulcerative stage of deeper dermatitis, etc. Disadvantage: stains skin and linens

CAUTION: Avoid use over extensive areas

℞ 42

Compound quinolor ointment	15.0
Rose water ointment q.s. ad	60.0

Misce et fiat

Signa: Apply three times daily

Indication: Parasiticidal, fungicidal, bactericidal ointment for the treatment of dermatophytoses, tinea versicolor, folliculitis, Bockhart impetigo and pyodermas

NOTE. Compound quinolor ointment for children may be prepared by incorporating 0.5 Gm. of chlorhydroxyquinoline in 50 Gm. each of hydrous wool fat and white petrolatum

℞ 43

Vioform (1%) (iodochlorhydroxyquinoline N.F.)	0.6
Rose water ointment q.s. ad	60.0

Misce et fiat

Signa: Apply three times daily

Indication: Bactericidal and antiseborrheic ointment for the treatment of acute and chronic dermatoses, atopic dermatitis, psoriasis, intertrigo, seborrheic dermatitis, eczema of the external auditory canal

℞ 44

Ammoniated mercury ointment	
Petrolatum aa	30.0

Misce et fiat

Signa: Apply to lesions by means of gauze or lint every two hours. (This prescription is approximately one-half the official strength applicable when treating lesions on the glabrous skin)

Indication: Bactericidal, antiseborrheic ointment for the treatment of pyoderma, impetigo contagiosa and seborrheic dermatitis

℞ 45

Precipitated sulfur (3%)	0.9
Crude coal tar (3%)	0.9
Zinc oxide ointment q.s. ad	30.0

Misce et fiat

Signa: Apply by inunction three times daily

Indication: Antiseborrheic ointment for seborrheic dermatitis of the glabrous skin, mildly antipruritic

℞ 46

Chrysarobin ointment (1.3%)	30.0

keratolytic ointment; fungicidal. For use in

Signa: Apply once daily

Indication: Antipsoriatic (reducing agent) and psoriasis, seborrheic dermatitis of the body, tinea capitis and tinea circinata. Use with caution around the eyes

NOTE. Anthralin ointment 0.1% may be prescribed when chrysarobin cannot be obtained

℞ 47

Salicylic acid (3%)	2.7
Ammoniated mercury (5%)	4.5
Polyethylene glycol ointment	90.0

Misce et fiat

Signa: Apply by inunction twice daily

Indication: A standard antiseborrheic, antipsoriatic ointment for use in psoriasis, seborrheic capitis and seborrheic dermatitis

℞ 48

Iodine (3%)	1.8
Hydrous wool fat or goose grease	60.0

Misce et fiat

Signa: Apply by inunction twice daily

Indication: Bactericidal, fungicidal ointment for the treatment of impetigo contagiosa, tinea capitis and tinea circinata

℞ 49

Seamcyl ointment (contains Phenoxerol)	60.0

Signa: Apply to lesions twice daily

Indication: Fungicidal ointment for treatment of dermatophytosis, tinea circinata and tinea capitis

℞ 50

Copper undecylenate ointment	30.0

Signa: Apply to lesions twice daily

Indication: Fungicidal ointment for treatment of dermatophytosis, tinea circinata and tinea capitis

℞ 51

Salundek	30.0

Signa: Apply to lesions twice daily

Indication: Fungicidal ointment for treatment of dermatophytosis, tinea circinata and tinea capitis

℞ 52

Salicidol	30.0

Signa: Apply to lesions twice daily

Indication: Fungicidal ointment for treatment of dermatophytosis, tinea circinata, tinea capitis

℞ 53

Anthralin ointment 0.1-0.25%	30.0

Signa: Apply once daily

Indication: Antipsoriatic ointment

℞ 54

Compound undecylenic acid ointment N.F.	30.0

Signa: Apply locally once daily

Indication: Fungicidal ointment for treatment of dermatophytosis, tinea pedis, tinea capitis and tinea circinata

NOTE. This ointment consists of 5% undecylenic acid, 20% zinc undecylenate in polyethylene glycol ointment

℞ 29

Salicylic acid (3%) 2.7
Resorcinol (3.5%) 2.7-4.5
Alcohol (70%) 90.0
Misce et fiat

Signa. Apply several times daily

Indication. A keratolytic, antipruritic lotion (e.g., for seborrheic dermatitis)

Ointments

℞ 30

Salicylic acid (0.5%)
Ichthammol (0.5%) aa 0.45
Hydrophilic petrolatum
Zinc oxide ointment aa q.s. ad 90.0
Misce et fiat

Signa. Apply 3 or more times daily. Bandage

Indication. A mild antiphlogistic, keratoplastic, antipruritic ointment for the treatment of chronic lichenified dermatoses; e.g., for chronic stage of atopic dermatitis, psoriasis, xeroderma, etc.

℞ 31

Salicylic acid (0.5%) *0.6*
Rose water ointment
Zinc oxide ointment aa q.s. ad 120.0
Misce et fiat

Signa. Apply freely several times daily and bandage

Indication. A mild keratoplastic ointment for softening the skin; e.g., for lichenified stage of atopic dermatitis, xeroderma etc.

℞ 32

Coal tar solution (0.5%) 0.6
Rose water ointment q.s. ad 120.0
Misce et fiat

Signa: Apply several times daily

Indication. A mild keratoplastic, antipruritic ointment to soften the skin for the treatment of dry dermatoses; e.g., in seborrheic dermatitis, lichenified stage of atopic dermatitis, xeroderma, etc.

℞ 33

Salicylic acid (0.5%) 0.3
Pine tar (0.5-1.0%) 0.3-0.6
Rose water ointment q.s. ad 60.0
Misce et fiat

Signa. Apply several times daily

Indication. A mild keratoplastic antipruritic ointment for the treatment of dry dermatoses, seborrheic dermatitis, lichenified stage of atopic dermatitis, xeroderma, etc.

℞ 34

Peruvian balsam (4%) 4.8
Bismuth subnitrate 4.0
Castor oil 4.0
Rose water ointment
Zinc oxide ointment aa q.s. ad 120.0
Misce et fiat

Signa. Apply freely each time soiled diaper is changed

Indication. A mild antiseptic, astringent and healing ointment for the treatment of diaper dermatitis

℞ 35

Salicylic acid (5-10%) 6.0-12.0
Hydrous wool fat 30.0
Goose grease vel
benzoinated lard q.s. ad 120.0
Misce et fiat

Signa: Apply by inunction several times daily

Indication. A keratolytic ointment for the treatment of ichthyosis, keratosis palmaris et plantaris, seborrheic dermatitis of the scalp and xeroderma

℞ 36

Peruvian balsam (1%) 0.3
Zinc oxide 4.0
Rose water ointment q.s. ad 30.0
Misce et fiat

Signa. Apply t.i.d.

Indication. An antiphlogistic and healing ointment, for the treatment of perlèche, fissures

℞ 37

DDT or Peruvian balsam (10%) *12.0*
Petrolatum 120.0
Misce et fiat

Signa. Apply at night. Shampoo following morning

Indication. Pediculicidal ointment

℞ 38

Ammoniated Mercury Ointment
U.S.P. (5%) 60.0
Misce et fiat

Signa. Apply thoroughly to hair and scalp at night and follow by soap and hot water shampoo in morning. Use fine-toothed comb dipped in vinegar to remove nits

Indication. Pediculicidal, germicidal and keratolytic ointment for the treatment of pediculosis capitis, pyoderma of the scalp, impetigo contagiosa and seborrheic dermatitis

NOTE. Should not exceed 3% for the glabrous skin in children

℞ 39

Rose water ointment
Zinc oxide ointment aa q.s. 30.0
Misce et fiat

Signa. Apply p.r.n.

Indication. A mild antiphlogistic cooling ointment (creme) for the treatment of acute erythematous (non-exudative) dermatoses; e.g., eczematoid dermatitis and dry type of skin

℞ 40

Salicylic acid (3%) 1.8
Pine tar ointment
Rose water ointment aa q.s. ad 60.0
Misce et fiat

Signa. Apply several times daily

Indication. Keratolytic ointment for hyperkeratoses; e.g., psoriasis, seborrheic dermatitis, ichthyosis vulgaris

sub-acute stage of any exudative dermatoses as in the interim (sub-acute) stage of atopic dermatitis Used to absorb residual exudate (All pastes are drying.) with addition of mild reducing (keratolytic) agent

Emulsions

℞ 68

Phenol or menthol (0.1%) 0 06
Sodium perborate (10%) 6 0
Emulsion base q.s. ad 60 0
Misce et fiat

Signa: Apply to affected areas every two hours

Indication. Antipruritic, antiphlogistic cream for treatment of sub-acute stage of dermatitis venenata (poison ivy poison sumac poison oak) and other contact dermatitis. Emulsion base is greaseless cream

℞ 69

Wool fat U S P 30 0
Olive oil 120 0
Heat in mortar and mix well and add
Zinc oxide 30 0
Talc 30.0
Mix very well and add
aluminum acetate solution 6 0
Calcium hydroxide solution q ad
to make 300 0

NOTE Mix in the above order Menthol, 0 1 to 0 25% or liquor carbonis detergens 0 5 to 1 0% may be added for antipruritic effect. The above preparation is directed to be prepared according to Rosen's method, New York The coal tar solution is antipruritic (Burow' Emulsion)

Signa Apply frequently T be dispensed in wide-mouthed bottle

Indication Antiphlogistic emulsion indicated when water-in-oil type of remedy is needed as for the treatment of dry inflammatory dermatoses which are non-exudative intertrigo, chronic atopic dermatitis (lichenified stage) Antipruritics may be added

℞ 70

Zinc oxide 80 0
Olive oil 120 0
Misce et fiat

Signa Apply at frequent intervals

Indication A protective antiphlogistic emulsion for the treatment of dry inflammatory dermatoses such are non-exudative intertrigo, chronic atopic dermatitis (lichenified stage) Antipruritic may be added

Paints and Dyes

℞ 71

Methylrosaniline violet (1 %) 0 6-1
Alcohol 95%) 4 0
Distilled water q ad 60 0
Misce et fiat

Signa Apply with cotton applicator Follow by dusting of unscented talc after paint dries if lesions are on the skin

Indication: Monilicidal, for localized candidiasis (thrush) of the mucous membranes of the mouth and the glabrous skin

℞ 72

Chrysarobin (10%) 3.0
Chloroform 30 0
Misce et fiat

Signa: Apply cautiously Avoid around the eyes

Indication For localized patches (plaques) of psoriasis in older children (Andrews—modified)

℞ 73

Ichthammol 60 0

Signa Paint upon lesions once daily When dry apply purified talc

Indication. Reducing remedy for the treatment of chronic atopic dermatitis Antipsoriatic

℞ 74

Triple dye
Gentian violet (1%) 0.3
Brilliant green (1%) 0 3
Acriflavine hydrochloride (1/10%) 0 03
Distilled water q.s. ad 30 0
Misce et fiat

Signa: Apply as paint once or twice daily

Indication. Bactericidal, fungicidal for dermatophytoses, tinea pedis, tinea circinata, pyoderma, impetigo contagiosa

Powders

℞ 75

Zinc stearate
Talc
Bentonite aa 30 0
Misce et fiat pulveres

Signa Apply freely

Indication Antiphlogistic dusting powder for dermatophytoses, tinea pedis, tinea cruris, intertrigo

℞ 76

Prepared calamine
Bentonite
Zinc oxide
Starch aa 30 0
Misce et fiat pulveres

Signa. Dust freely upon skin

Indication. Antiphlogistic dusting powder for dermatophytoses, tinea pedis, tinea cruris, intertrigo

℞ 77

Menthol (1/10%) 0 12
Bentonite 60 0
Talc 60.0
Misce et fiat pulveres
Dispense in scatula

Signa Use freely as dusting powder

Indication: Antiphlogistic, cooling, dusting powder mildly antipruritic, for dermatophytoses, tinea pedis, tinea cruris, intertrigo, later stage of herpes simplex and herpes zoster

℞ 55

Benzoic and salicylic acid ointment U.S.P. (Whitfield's Ointment) 30.0
Petrolatum q.s. ad 60.0
Misce et fiat
Signa. Apply locally as indicated one or more times daily
Indication. Keratolytic, fungicidal ointment for the treatment of dermatophytosis, tinea pedis, tinea capitis, tinea circinata and seborrheic dermatitis

℞ 56

Phenol (0.25%) 0.25
Menthol (0.25%) 0.25
Zinc oxide ointment
Rose water ointment (without rose oil) q.s. ad 90.0
Misce et fiat
Signa. Apply frequently
Indication. An antipruritic, cooling ointment for acute and sub-acute inflammatory dermatoses

℞ 57

Menthol (1%) 0.5
Salicylic acid 1.0
Petrolatum 50.0
Misce et fiat
Signa. Apply locally
Indication. Antipruritic ointment, e.g., for lichen urticatus (Kleinschmidt-Greenwald)

Antibiotic Ointments

℞ 58

Bacitracin ointment (500 units per Gm.) 30.0
Misce et fiat
Signa. Apply every two hours
Indication. Bactericidal ointment for pyoderma, impetigo contagiosa, etc.

℞ 59

Tyrothricin ointment (0.5 mg. per Gm.) 30.0
Misce et fiat
Signa. Apply every two hours
Indication. Bactericidal ointment for pyoderma, impetigo contagiosa, etc.

℞ 60

Aureomycin ointment (30 mg. per Gm.) 30.0
Misce et fiat
Signa. Apply every two hours
Indication. Bactericidal ointment for pyoderma impetigo contagiosa, etc.

℞ 61

Neomycin ointment 30.0
Misce et fiat
Signa. Apply every two hours
Indication. Bactericidal ointment for pyoderma, impetigo contagiosa etc. Myciguent Ointment is a satisfactory neomycin ointment. Various ointment containing neomycin in combination with other antibiotics marketed

℞ 62

Erythromycin ointment 30.0
Signa. Apply every two hours
Indication. Bactericidal ointment for pyoderma, impetigo contagiosa, etc.

℞ 63

Tyrotrace 1 tube (15 Gm.)
Signa. Apply twice daily
Indication. Bactericidal ointment for pyoderma, impetigo contagiosa, etc. (Each gram of Tyrotrace contains 500 units bacitracin and 500 µg. tyrothricin)

Pastes

℞ 64

Zinc oxide paste U.S.P. 120.0
(Lassar's Plain Zinc Paste)
Signa. Apply on several layers of lint or muslin
Indication. For use in the sub-acute stage of any exudative dermatosis as in the interim (sub-acute) stage of atopic dermatitis. Used to absorb residual exudate. (All pastes are drying)

℞ 65

Menthol (0.1%) 0.09
Salicylic acid (0.5%) 0.45
Zinc oxide paste q.s. ad 90.0
Misce et fiat
Signa. Apply every four hours
Indication. Antipruritic, for use in the sub-acute stage of any exudative dermatosis as in the interim (sub-acute) stage of atopic dermatitis. Used to absorb residual exudate. (All pastes are drying)

℞ 66

10-20-30 Paste
Aluminum acetate solution 10.0
Anhydrous lanolin 20.0
Zinc oxide paste 30.0
Misce et fiat
Signa. Apply on muslin or lint several times daily
Indication. Antiphlogistic—for sub-acute stage of any exudative dermatosis as in the interim (sub-acute) stage of atopic dermatitis. Used to absorb residual exudate. (All pastes are drying)
(Antipruritics such as 0.25-0.5% phenol 0.1% menthol, 0.5-1.0% coal tar solution, or 0.5-1.0% ichthammol may be added for their therapeutic effect)

℞ 67

Ichthammol (1%) 0.6
or
Coal Tar Solution U.S.P. 10.0
Anhydrous lanolin 20.0
Zinc oxide paste U.S.P. 30.0
Misce et fiat
Signa. Apply p.r.n.
Indication. Mildly antipruritic. For use in the

Collodion 30.0
Misce et fiat
Signa: Apply by means of a cotton applicator after first rupturing vesicles
Indication: A drying, mildly germicidal collodion to prevent spread of lesions of impetigo contagiosa. Not applicable to extensive involvement of the skin

℞ 91
Nitromersol tincture N.F.
(metaphen tincture) (1:500)
Collodion aa q.s. 60.
Misce et fiat
Signa: Apply t.i.d.
Indication. Germicidal, for localized lesions of impetigo contagiosa and to prevent spread of lesions. Useful for few localized lesions

℞ 92
Chrysarobin (5-10%) 3.0-6.0
Traumaticin
(Liq. Guttae Perchae N.F.) 60.0
Misce et fiat
Signa: Use cautiously. Avoid region of face around eyes. Apply once daily or every second day by means of cotton applicator or camel's hair brush
Indication. Antipsoriatic for localized patches (plaques) of psoriasis
NOTE. ℞ 33 may be used when chrysarobin is unobtainable

℞ 93
Ichthammol (5%) 4.5
Collodion 90.0
Misce et fiat
Signa: Apply daily
Indication: Keratolytic and reducing agent for localized patch (plaque) of neurodermatitis

Sun Screens

℞ 94
Petrolatum (dark red petrolatum) 120.0
vel
Phenyl salicylate (10%) 12.0
Petrolatum q. ad 120.0
Misce et fiat
Signa: Apply freely
Indication: Effective sun screen. For solar dermatitis, lupus erythematosus, xeroderma pigmentosum, summer prurigo of Hutchinson, etc

℞ 95
Ethyl aminobenzoate (benzocaine) 2.0
Methyl salicylate 10.0
Rose water ointment 88.0
Misce et fiat
Signa: Apply freely
Indication: Effective sun screen. For solar dermatitis, lupus erythematosus, xeroderma pigmentosum, summer prurigo of Hutchinson (. Schwartz)

℞ 96
Paraaminobenzoic acid (5-10%) 9.0-18.0
Alcohol U.S.P. (70%) 180.0
Misce et fiat
Signa: Apply to all exposed areas before going out into sun. Re-apply lotion if washed off in swimming
Indication. Effective sun screen. For solar dermatitis, lupus erythematosus, xeroderma pigmentosum, summer prurigo of Hutchinson (C. Shaw)

℞ 97
Titanium dioxide (1%) 0.6
Zinc oxide 12.0
Petrolatum q. ad 60.0
Misce et fiat
Signa: Apply to face before exposing to sun
Indication. Effective sun screen. For solar dermatitis, lupus erythematosus, xeroderma pigmentosum, summer prurigo of Hutchinson
NOTE: Titanium dioxide cream containing 5.0 per cent titanium dioxide, 0.5 per cent menthol and 0.5 per cent thymol, is useful as protective sun screen. Van-Tek (Ulmer) vanishing cream containing titanium dioxide, lanolin and magnesium stearate, is also useful as sun screen

℞ 98
Sun lotion ("Sun tan screen")
N.F. 8th Ed. 120.0
Signa: Apply before exposure to sun
Indication: Effective sun screen. For solar dermatitis, lupus erythematosus, xeroderma pigmentosum, summer prurigo of Hutchinson
NOTE. This preparation contains phenyl salicylate, ethyl-aminobenzoate, titanium dioxide, zeolization, yellow ferric oxide, coumarin, triethanolamine, cetyl alcohol, stearic acid, glycerin and distilled water. It is an emulsion of an ointment-like consistency

℞ 99
Calamine 15.0
Lanolin 12.5
Petrolatum 37.5
Water 35.0
Misce et fiat
Signa. Apply before exposure to sun
Indication. Effective sun screen. For solar dermatitis, lupus erythematosus, xeroderma pigmentosum, summer prurigo of Hutchinson (Schwartz and Peck)

℞ 100
Menthyl anthranilate 10.0
Castor oil 20.0
Alcohol q.s. ad 100.0
Misce et fiat
Signa: Apply before exposure to sun
Indication. Effective sun screen. For solar dermatitis, lupus erythematosus, xeroderma pigmentosum, summer prurigo of Hutchinson
NOTE. For economic reasons isopropyl alcohol may be used instead of ethyl alcohol

℞ 78

Menthol		0.1
Zinc oxide		
Talc	aa ad	25.0

Misce et fiat pulverus

Signa To be dusted on skin

Indication Antiphlogistic, cooling, dusting powder mildly antipruritic for dermatophytosis, tinea pedis, tinea cruris, intertrigo late stage of herpes simplex and herpes zoster

Tinctures

℞ 79

Methylrosaniline violet (1%)	0.3
Benzoin tincture	30.0

Misce et fiat

Signa Apply to lesions by means of a cotton applicator three times daily

Indication Moniliciddal paint for localized lesions of candidiasis on mucous membrane of mouth and lips (perlèche) fissures of lips. Because of drying effect, is of value for localized lesions of impetigo contagiosa

℞ 80

Chrysarobin (5-10%)	1.5-3.0
Benzoin tincture	30.0

Misce et fiat

Signa. Paint upon lesions once daily Not to be used around the eyes

Indication An antipsoriatic paint for localized patches (plaques) of psoriasis

NOTE ℞ 53 may be used when chrysarobin is unavailable

℞ 81

Resorcinol (10%)		12.0
Alcohol (70%)	q.s. ad	120.0

Misce et fiat

Signa Apply at night

Indication. An antipruritic lotion, mildly antiseptic, for acute inflammatory dermatitis following stings and bites of insects

℞ 82

Strong iodine tincture N.F IX	*30.0*

Signa. Apply with cotton applicator once daily after manual epilation

Indication. Parasiticidal, fungicidal, for treatment of tinea circinata and tinea capitis

℞ 83

Strong tincture iodine		
Tincture aconite	aa	1.5
Alcohol (isopropyl)	q.s. ad	30.0

Misce et fiat

Signa. Paint on lesions twice daily

Indication. Parasiticidal, fungicidal, for treatment of tinea circinata and tinea capitis

℞ 84

Camphor spirit N.F	90.0

Signa. Apply to lesions p.r.n.

Indication. *Mild counterirritant, antipruritic for* acute inflammatory dermatosis following bites and stings of insects and as prophylactic

℞ 85

Menthol (0.5%)	0.9
Alcohol (70%)	180.0

Misce et fiat

Signa. *Apply to skin for itching p.r.n.*

Indication. Mild *rubefacient, antipruritic, for* acute inflammatory dermatosis following bites and stings of insects. Also repellent

Keratolytic Oil

℞ 86

Salicylic acid (3%)	15.0
Liquid petrolatum	500.0

Misce et fiat

Signa. Apply to lesions upon several layers of gauze. Allow to remain four to six hours

Indication. Keratolytic oil, particularly useful to soften crusts preliminary to treatment with antibiotics and germicidal remedies, e.g., in impetigo contagiosa

Detergent

℞ 87

Soft Soap Liniment, U.S.P	
(Tincture of green soap)	*240.0*

Signa. To be used with warm water upon gauze or cotton

Indication A cleansing soap particularly useful to soften crusts preliminary to treatment with antibiotics and germicidal remedies e.g in impetigo contagiosa

Glycerites

℞ 88

Salicylic acid (3%)	3.6
Starch glycerite	120.0

Misce et fiat

Signa. Apply freely

Indication. A keratolytic glycerite of starch particularly useful to soften dried crusts preliminary to treatment with antibiotics and bactericidal remedies; e.g in impetigo contagiosa. Also useful to soften a dry skin, e.g., in xeroderma, ichthyosis vulgaris

℞ 89

Boroglycerin Glycerite N.F	180.0

Signa: Rub into skin by inunction following bath

Indication A keratolytic glycerite for removing *dried crusts and softening* the skin of the scalp e.g in seborrheic dermatitis of the scalp and impetigo contagiosa of the scalp Should not be used on glabrous skin

Collodions

℞ 90

Methylrosaniline violet (1%)	0.3

Additional Tablets

℞ 115
Hydrocortisone acetate tablets each 5 mg.
Mitte tales No. XX
Signa: One tablet t.i.d. for [illegible] days; then gradually reduce to 1 tablet daily for another three to four days and discontinue
Indication: Corticosteroid therapy (see ℞ 101)

℞ 116
Acetylsalicylic acid tablets 0.3 Gm.
Mitte tales No. XII
Signa: One tablet every four hours. Repeat at bedtime
Indication. Sedative for mild types of pruritus, [illegible] in dermatitis venenata
NOTE. Acetylsalicylic acid may be administered in dose of 1 gr. (0.065 Gm.) for each year of the child's age until the age of 5 years, [illegible] the dose should be 5 gr. (0.32 Gm.) at each dose

℞ 117
Phenobarbital sodium tablets 0.016-0.032
Mitte tales No. XII
Signa: One tablet every four hours and before bedtime (depending on age of child)
Indication: Sedative

℞ 118
Desiccated thyroid tablets aa 0.065
Mitte tales No. XXX
Signa: One daily (for children of pre-school age)
Indication: Dermatoses accompanied by low basal metabolism, hypothyroidism, ichthyosis vulgaris, myxedema

℞ 119
Riboflavin tablets 1 mg.
Mitte tales No. XXX
Signa: One or more tablets (to be determined by physician depending upon condition of the patient)
Indication. Specific in ariboflavinosis; also useful in cheilosis and follicular keratoses and for relief of symptoms in riboflavin deficiency in pellagra

Capsules

℞ 120
Vitamin A capsules*
(any reliable brand) aa 50,000 units
Mitte tales No. C
Signa: One to four capsules daily depending on age. Larger doses should be used cautiously

Indication. Severe grades of vitamin A deficiency, certain types of hyperkeratosis of the skin, e.g., keratosis pilaris, keratosis follicularis; also in acne vulgaris

℞ 121
Vitamin A capsules* aa 25,000 units
Mitte tales No. C
Signa: One capsule once or twice daily
Indication: Vitamin A deficiency, certain types of hyperkeratosis of the skin; e.g., keratosis pilaris, keratosis follicularis; also in acne vulgaris

The Removal of Stains†

The removal from skin and fabrics of stains which are the result of topical therapeutic remedies used in the management of dermatoses is a matter of considerable importance and concern to both physician and parents. In general, those methods for removing stains from adults are equally good for infants and children. However because the dermal network in infants and younger children is more vulnerable to many topical agents, it is good rule to use such remedial agents cautiously in the young. A [illegible] skin in an infant or young child is especially likely to be traumatized from agents used to remove stains, often with a resultant contact dermatitis; this reaction occurs far more frequently than in the skin of adults. Furthermore, most mothers dislike the inconvenience and unsightly appearance which dyes create on skin and fabrics. For this reason, they are anxious to have such remedial agents removed as soon possible. The toxic effect which sometimes occurs when dyes are applied to the skin is still another factor which detracts from their usefulness. Nevertheless, such remedies are at times helpful, particularly in the management of dermatoses that are recalcitrant to the usual orthodox therapy. When stain removers are found necessary they should be prescribed in mildest effective concentration and, after their use soap and water should be used to remove thoroughly any chemicals left on the skin.

In removing stains from fabrics, the chemicals used should be of such a nature that they will not damage the material. Colored cloth may be affected by oxidizing (and in some instances by reducing) chemicals. Because of the implications stated, I have followed the conservative rule of allowing the dye or preparation to remain on the skin instead of attempting to remove it by means of chemical agents. Instead, I have relied on the daily colloid bath (e.g. starch), which with the passing of time will result in a fading or complete disappearance of the stain. This procedure has been followed particularly on those areas of the skin

* A very useful preparation for administering vitamin A in liquid form is Aquasol A. Each 0.1 cc. (3 drops) contains 5,000 units of vitamin A. Arovitdrops, 30 drops contain approximately 50,000 units vitamin A and may be administered in fruit juice one or more times daily according to the age of the patient and indication.

† I am indebted to E. L. Lowalles, Dean and Professor of Pharmacy and to Samuel S. Liberman, Associate Dean and Professor of Pharmacy, Columbia University School of Pharmacy, for their valuable assistance in compiling the material.

Internal Therapy

℞ 101

Fluid Cortef (Upjohn) 90.0

Signa One teaspoonful three times daily for three days, then reduce to one teaspoonful twice daily for the following two days and one teaspoonful daily for another few days

Indication When corticosteroid therapy is indicated in children 5-10 years of age (for temporary suppression of connective tissue activity) Has antiphlogistic effect. Used for producing temporary remission in acute lupus erythematosus, periarteritis nodosa dermatomyositis, scleroderma, hypersensitivity to drugs, pemphigus (rare in children) atopic dermatitis, psoriasis

NOTE 5 cc. contains 10 mg. of hydrocortisone cyclopentylpropionate

℞ 102

Chloral hydrate 6.2
Elixir pyribenzamine 60 0
Raspberry syrup N.F q s. ad 120.0
Misce et fiat

Signa One teaspoonful every four hours and before bedtime (for infants)

Indication Sedative with low index of sensitization. A good hypnotic in treating dermatosis accompanied by restlessness and wakefulness

℞ 103

Syrup of ferrous iodide 90 0

Signa 10 drops with fruit juice t i d. Cleanse teeth afterwards

Indication Hematinic

℞ 104

Cod liver oil 120 0

Signa One teaspoonful once or more times daily preferably after meals. May be followed by sucking on a peppermint lozenge in children

Indication. General malnourished states. Adjuvant to local therapy

℞ 105

Saccharated ferrous carbonate 16.0

Signa. ¼ teaspoonful in milk t.i d.

Indication Hematinic in secondary anemia

℞ 106

Aromatic fluidextract of cascara sagrada 120 0

Signa One teaspoonful before retiring. (Dose may be increased or decreased according to indications and age)

Indication. Laxative. Especially useful in tonic constipation and in acne vulgaris

℞ 107

Ferrous sulfate tablets 0.3
Mitte tales No. XXIV

Signa One tablet once or twice daily Older children

Indication Hematinic in secondary anemia and acne vulgaris

℞ 108

Tablets of Mercury with chalk aa 0 016
Mitte tales No. XXIV

Signa. One morning and night with milk

Indication Oral treatment of verrucae planae juvenilis

CAUTION Avoid prolonged use because of possibility of absorption and acrodynia

℞ 109

Sodium bromide 8.0
Compound pepsin elixir N.F q s. ad 90 0
Misce et fiat

Signa One teaspoonful with water every four hours. Older children

Indication Mild sedative

℞ 110

Phenobarbital elixir 120.0

Signa One teaspoonful every four hours

Indication Sedative

NOTE Each teaspoonful contains approximately 15 mg. of phenobarbital

℞ 111

Pyribenzamine elixir (each teaspoonful contains approximately 30 mg. pyribenzamine) vel 120.0
Benadryl elixir (each teaspoonful contains approximately 10 mg. of benadryl) vel 120.0
Thephorin elixir (each teaspoonful contains approximately 10 mg. of thephorin) vel 120 0

Signa: One teaspoonful every three hours

Indication. Antihistaminic and sedative for mild pruritus

℞ 112

Benadryl or pyribenzamine or thephorin tablets aa 50 mg
Mitte tales No. XXIV

Signa. Child 5 years and over ½ to 1 tablet every four hours

Indication Sedative

℞ 113

Milk of magnesia
Compound pepsin elixir aa q.s. 180 0
Misce et fiat

Signa Dessertspoonful to tablespoonful every four hours. "Shake well" label

Indication. Laxative e.g in food injury causing urticaria

℞ 114

Diluted hydrochloric acid 16 0
Pepsin and rennin elixir q s. ad 90 0
Misce et fiat

Signa: One teaspoonful diluted with water t.i.d.

Indication. Digestive remedy for food injury causing urticaria

Additional Tablets

15

Hydrocortisone acetate tablets each 5 mg.
Mitte tales No. XX
Signa: One tablet t.i.d. for two days; then gradually reduce to 1 tablet daily for another three to four days and discontinue
Indication. Corticosteroid therapy (see ℞ 101)

116

Acetylsalicylic acid tablets 0.3 Gm.
Mitte tales No. XII
Signa: One tablet every four hours. Repeat at bedtime
Indication. Sedative for mild types of pruritus; e.g., in dermatitis venenata

NOTE. Acetylsalicylic acid may be administered in dose of 1 gr. (0.065 Gm.) for each year of the child's age until the age of 5 years, then the dose should be 5 gr. (0.32 Gm.) at each dose.

℞ 117

Phenobarbital sodium tablets 0.016-0.032
Mitte tales No. XII
Signa: One tablet every four hours and before bedtime (depending on age of child)
Indication. Sedative

℞ 118

Desiccated thyroid tablets aa 0.065
Mitte tales No. XXX
Signa: One daily (for children of pre-school age)
Indication. Dermatoses accompanied by low basal metabolism, hypothyroidism, ichthyosis vulgaris, myxedema

℞ 119

Riboflavin tablets 1 mg.
Mitte tales No. XXX
Signa: One or more tablets (to be determined by physician depending upon condition of the patient)
Indication. Specific in ariboflavinosis, also useful in cheilosis and follicular keratoses and for relief of symptoms in riboflavin deficiency in pellagra

Capsules

℞ 120

Vitamin A capsules (any reliable brand) aa 50,000 units
Mitte tales No. C
Signa: One to four capsules daily depending on age. Larger doses should be used cautiously
Indication. Severe grades of vitamin A deficiency, certain types of hyperkeratosis of the skin; e.g., keratosis pilaris, keratosis follicularis; also in acne vulgaris

℞ 121

Vitamin A capsules* aa 25,000 units
Mitte tales No. C
Signa: One capsule once or twice daily
Indication. Vitamin A deficiency, certain types of hyperkeratosis of the skin; e.g., keratosis pilaris, keratosis follicularis; also in acne vulgaris

The Removal of Stains†

The removal from skin and fabrics of stains which are the result of topical therapeutic remedies used in the management of dermatoses is a matter of considerable importance and concern to both physician and parents. In general, those methods for removing stains from adults are equally good for infants and children. However, because the dermal network in infants and younger children is more vulnerable to many topical agents, it is good rule to use such remedial agents cautiously in the young. A thick skin in an infant or young child is especially likely to be traumatized from agents used to remove stains, often with a resultant contact dermatitis; this reaction occurs far more frequently than in the skin of adults. Furthermore, most mothers dislike the messiness and unsightly appearance which dyes create on skin and fabrics. For this reason, they are anxious to have such remedial agents removed as soon as possible. The toxic effect which sometimes occurs when dyes are applied to the skin is still another factor which detracts from their usefulness. Nevertheless, such remedies are at times helpful, particularly in the management of dermatoses that are recalcitrant to the usual orthodox therapy. When stain removers are found necessary, they should be prescribed in mildest effective concentration and, after their use, soap and water should be used to remove thoroughly any chemicals left on the skin.

In removing stains from fabrics, the chemicals used should be of such nature that they will not damage the material. Colored cloth may be affected by oxidizing (and in some instances by reducing) chemicals. Because of the implications stated, I have followed the conservative rule of allowing the dye or preparation to remain on the skin instead of attempting to remove it by means of chemical agents. Instead, I have relied on the daily colloid bath (e.g., starch), which with the passing of time will result in a fading or complete disappearance of the stain. This procedure has been followed particularly on those areas of the skin

* A very useful preparation for administering vitamin A in liquid form is Aquasol A. Each cc. (drops) contains 500 units vitamin A. Accordingly, 30 drops contain approximately 10,000 units vitamin A and may be administered in fruit juice one or more times daily according to the age of the patient and indication.

† I am indebted to E. E. Leuallen, Dean and Professor of Pharmacy, and to Samuel S. Liberman, Associate Dean and Professor of Pharmacy, Columbia University School of Pharmacy, for their valuable assistance in compiling the material.

Internal Therapy

℞ 101

Fluid Cortef (Upjohn) 90.0

Signa One teaspoonful three times daily for three days; then reduce to one teaspoonful twice daily for the following two days and one teaspoonful daily for another few days

Indication When corticosteroid therapy is indicated in children 5-10 years of age (for temporary suppression of connective tissue activity) Has antiphlogistic effect. Used for producing temporary remission in acute lupus erythematosus, periarteritis nodosa, dermatomyositis, scleroderma hypersensitivity to drugs, pemphigus (rare in children) atopic dermatitis, psoriasis

NOTE 5 cc. contains 10 mg. of hydrocortisone cyclopentylpropionate

℞ 102

Chloral hydrate 6.2
Elixir pyribenzamine 60.0
Raspberry syrup N.F. q.s. ad 120.0
Misce et fiat

Signa One teaspoonful every four hours and before bedtime (for infants)

Indication Sedative with low index of sensitization. A good hypnotic in treating dermatosis accompanied by restlessness and wakefulness

℞ 103

Syrup of ferrous iodide 90.0

Signa. 10 drops with fruit juice t.i.d. Cleanse teeth afterwards

Indication Hematinic

℞ 104

Cod liver oil 120.0

Signa. One teaspoonful once or more times daily preferably after meals. May be followed by sucking on a peppermint lozenge in children

Indication General malnourished states. Adjuvant to local therapy

℞ 105

Saccharated ferrous carbonate 16.0

Signa. ¼ teaspoonful in milk t.i.d.

Indication Hematinic in secondary anemia

℞ 106

Aromatic fluidextract of cascara sagrada 120.0

Signa One teaspoonful before retiring. (Dose may be increased or decreased according to indications and age)

Indication Laxative. Especially useful in atonic constipation and in acne vulgaris

℞ 107

Ferrous sulfate tablet 0.3
Mitte tales No. XXIV

Signa. One tablet once or twice daily Older children

Indication Hematinic in secondary anemia and acne vulgaris

℞ 108

Tablets of Mercury with chalk aa 0.016
Mitte tales No. XXIV

Signa One morning and night with milk

Indication Oral treatment of verrucae planae juveniles

CAUTION Avoid prolonged use because of possibility of absorption and acrodynia

℞ 109

Sodium bromide 8.0
Compound pepsin elixir N.F. q.s. ad 90.0
Misce et fiat

Signa One teaspoonful with water every four hours. Older children

Indication. Mild sedative

℞ 110

Phenobarbital elixir 120.0

Signa One teaspoonful every four hours

Indication Sedative

NOTE. Each teaspoonful contains approximately 15 mg. of phenobarbital

℞ 111

Pyribenzamine elixir (each teaspoonful contains approximately 30 mg. pyribenzamine) vel 120.0

Benadryl elixir (each teaspoonful contains approximately 10 mg. of benadryl) vel 120.0

Thephorin elixir (each teaspoonful contains approximately 10 mg. of thephorin) vel 120.0

Signa. One teaspoonful every three hours

Indication Antihistaminic and sedative for mild pruritus

℞ 112

Benadryl or pyribenzamine or thephorin tablets aa 50 mg.
Mitte tales No. XXIV

Signa. Child 5 years and over ½ to 1 tablet every four hours

Indication Sedative

℞ 113

Milk of magnesia
Compound pepsin elixir aa q.s. 180.0
Misce et fiat

Signa. Dessertspoonful to tablespoonful every four hours. "Shake well" label

Indication. Laxative e.g., in food injury causing urticaria

℞ 114

Diluted hydrochloric acid 16.0
Pepsin and rennin elixir q.s. ad 90.0
Misce et fiat

Signa. One teaspoonful diluted with water t.i.d.

Indication. Digestive remedy for food injury causing urticaria

following procedure for the removal of mercurochrome stains from silks Two treatments with benzaldehyde followed by 25% hydrochloric acid application and water Another method consists of first applying glaciale acetic acid which is followed by ether Still a third method is the use of phosphoric acid in rubbing alcohol

Cotton and linen.—For colorless cotton or linen cloth, *The Pharmaceutical Recipe Book* (The American Pharmaceutical Association, 1943) recommends the following method

A	Solution of sodium hypochlorite	10 cc
	Water	90 cc.
B.	Diluted acetic acid	20 cc

Soak the material in Solution A for 2 minutes. Without taking the fabric out, add Solution B and mix thoroughly agitating the cloth to hasten removal of the stain This should take about 1 minute. Wash the material thoroughly in hot water

Metaphen

Skin.—Use rubbing alcohol, followed by soap and water

Fabric.—Wash with soap and water dilute bleach solution may be required

Methylrosaniline Violet

(Gentian Violet)

See Acriflavine.

Peruvian Balsam

Stains on the diaper material and on cotton material resulting from the use of ointments containing balsam of peru may be removed by soaking them in 95% alcohol or in chloroform

Pine T Ointment

See Coal Tar Ointment

Potassium Permanganate

Skin.—Same under Fabric. Exercise care, since solutions are irritating to open wounds

Fabric.—Soak in dilute acetic acid, followed by 3% hydrogen peroxide solution. Lemon juice may be substituted for the acetic acid. This procedure may also be used for removing stains from the bath tub. Weak solution of oxalic acid may be used instead.

Scarlet Red

Skin.—Wash thoroughly with soap and water followed by washing with rubbing alcohol.

Fabric.—Wash with detergent, followed by soaking in rubbing alcohol. Treat with diluted sodium hypochlorite solution if necessary Rinse thoroughly

Silver Nitrate

(Toughened Silver Nitrate, Silver Nitrate Pencils, Lunar Caustic)

Skin.—Silver nitrate leaves a brown stain on the skin which finally turns black. An effective means for removing such stains on the skin consists of first painting the areas with either a 1 or 2% tincture of iodine and then applying a 5 or 10% solution of sodium thiosulfate. Another method consists of gently applying the following preparation to the stains bichloride of mercury 1 part; ammonium chloride, 1 part; and distilled water 8 parts. Skin stains become whitish yellow and soon disappear after the application.

Cotton linen ool.—Apply the preparation given under Skin which consists of bichloride of mercury ammonium chloride and distilled water by means of cloth and rub gently

Triple Dye

(Mixed Dye)

Skin.—*See* Acriflavine

Fabric.—Soak in rubbing alcohol acidified with hydrochloric acid. Rinse thoroughly with water Wash with soap and water If necessary treat with dilute bleach solution, followed by dilute acetic acid Rinse thoroughly

covered by clothing. On the other hand, because of cosmetic effect and also for the reason that some mothers insist that stains on the exposed areas of the skin be removed, it becomes necessary to resort to the use of a stain remover Briefly such agents should be those that will produce as little trauma to the skin as is possible and which, at the same time, are therapeutically safe as well as effective and economical.

The removal of ointments and greasy topical preparations from the skin and cotton material may often be facilitated by means of a mixture of 10 parts of benzene and 100 parts of carbon tetrachloride. (Instead of carbon tetrachloride, some investigators have preferred, for ointment removal, the use of trichloroethylene or chloroform as part of the formula.) These preparations should be applied gently to the skin by means of linen or absorbent cotton.

Soaking a stubborn stain in a mixture of equal parts of glycerin and alcohol is often helpful as a preliminary treatment for removing the stain.

The agents which have been especially serviceable in removing stains resulting from dyes, ointments and other topical preparations contained in the Formulary are as follows:

Acriflavine

Skin—Wash with rubbing alcohol containing a few drops of dilute acetic acid. Rinse thoroughly and wash with soap and water

Fabric—Soak in rubbing alcohol containing a few drops of hydrochloric acid. Rinse thoroughly and then wash with soap and water Treatment with dilute sodium hypochlorite solution followed by dilute acetic acid may be required. Rinse thoroughly Another useful remedy is Camphor and Soap Liniment, N F 10th ed.

Anthralin and Anthralin Ointme t

Skin.—Stains a dark brown. Remove cautiously with chloroform, follow with use of Camphor and Soap *Liniment*, N.F 10th ed.

Fabric.—Soak in chloroform, followed by rubbing alcohol. Wash thoroughly with detergent, and treat with diluted bleach (sodium hypochlorite) solution.

Ben oin Tincture

Skin and linens—Stain may be removed by means of 95% alcohol, U.S.P

Chrysarobin

See Anthralin and Anthralin Ointment.

In another method chrysarobin stains may be removed by applying a weak solution of chlorinated lime (bleaching powder)

Chrysarobin Ointment

Skin.—Use degreasing solvent carefully For additional directions *see* Anthralin.

Fabric—Remove ointment with degreasing solvent. For additional directions *see* Anthralin.

Coal Tar Ointment

Skin.—Remove ointment with degreasing solvent. Wash with rubbing alcohol, followed by soap and water.

Fabric—Soak in degreasing solvent followed by soaking in rubbing alcohol. Wash thoroughly with suitable detergent. Additional treatment with washing soda solution may be necessary

Coal Tar Solution

Skin.—Wash with rubbing alcohol, followed by soap and water Camphor and Soap Liniment, N.F., 10th ed. should prove useful

Fabric—Soak in warm washing soda solution (10%) Wash thoroughly with detergent. Pretreatment with rubbing alcohol is of value.

Ichthammol

(Ichthyol)

Skin.—Stain may be removed by means of Camphor and Soap Liniment, N.F 10th ed.

Cotton.—Fresh stains are removed with regular wash. For old, hardened stains a presoftening by dipping in cresol solution before laundering is required.

Iodine

Skin.—A 5 to 10% solution of sodium thiosulfate may be used.

Cotton, linen rayon and woolen fabrics.—Iodine dropped on unstarched material makes a brown or yellow stain, on starched material a deep blue or black stain. Use a 5 to 10% solution of sodium thiosulfate (sodium hyposulfite) The stained portion of the fabric should be washed in the solution until the color has disappeared. This should be followed by a thorough rinsing in water and drying of the fabric in the sun.

Merbromin N.F

(Mercurochrome)

Skin.—Stains may be removed by a 2% solution of potassium permanganate followed by 5% oxalic acid or by the use of a solution of hypochlorite.

Silks—Bennett (Bennett, H *Cumulative Index The Chemical Formulary* [Brooklyn, N Y Chemical Publishing Co. Inc. 1944]) suggests the

logical peculiarities are milia of the face, the symphysis praeputialis, which disappears by desquamation, the mongol spots, and the superficial epithelial cysts in the mid-line of the hard palate. Several types of flat and faintly red small telangiectases are known as nevi pallida (stork-bites). Unna's nevus is a relatively inconspicuous macular purplish, irregularly contoured telangiectasis of the nape of the neck. Other similar vascular macules occur on the forehead, eyelids and elsewhere. Most of these vascular nevi disappear spontaneously. They should not be confused with true hemangiomas. Icterus neonatorum of varying degree, which occurs in about two out of three babies, clears up during the first week. A peculiarity of the infantile skin is its tendency to form blisters. Thus, scabies in early childhood, syphilis and even psoriasis, may produce large blebs and the urticaria of this age often shows a central vesicle and papular appearance that gives it the characteristics of strophulus.

The allergic skin reactions are likely to be vigorous or even violent so that a mild test reaction, e.g., a moderately positive Pirquet should be judged with great caution (Hecht). Of great importance is the hemorrhagic tendency in the newborn. In 66 per cent of babies, the endothelial permeability as measured by the number of petechiae elicited under controlled conditions by the application of a suction cup, is increased above the adult level. At the age of 10 years this physiological hemorrhagic tendency has disappeared. The incidence of the more severe hemorrhagic diathesis in the newborn is about one in two hundred, with a marked predisposition by asphyxia at birth. The disease is not noticeable at birth, but on the third day symptoms of hemorrhagic disease, such as the oozing of blood from the navel, from circumcision, or other wounds or bruises may become manifest. Often, large purpuric spots are seen, but according to Quick petechiae are characteristically absent. Melena neonatorum is the most common type of the disease due to hypoprothrombinemia. The prothrombin level at birth is near the adult level, but it may fall during the first few days to as low as 10 per cent, although it returns to normal by the end of the first week. The fall is due to a deficiency in vitamin K, the human body being unable to synthesize vitamin K, which comes entirely from plants. The newborn is physiologically provided with enough vitamin K from the mother to tide him over the first week, until he can begin to draw from the harvest of his intestinal flora which become established at this time. If the baby has not enough maternal vitamin K, or if his allotment becomes used up or destroyed before his own is ready for use, the level falls below the critical point with resulting hypoprothrombinemia and hemorrhage. Vitamin K restores the bleeding mechanism to normal. If 2 mg. of vitamin K (menadione) are given to the mother within two days before delivery the baby's vitamin K ration is increased enough to prevent hemorrhagic disease. The modern treatment of hemorrhagic disease of the newborn has reduced the mortality from 57 to 20 per cent.

The effect of maternal placental hormones explains a group of phenomena in the skin. The squamous epithelium of the vagina of newborn girls, develops a marked hyperplasia becoming piled up to a thickness of 30 to 40 layers with the top layer constantly desquamating. The vaginal smears show an abundance of navicular squamous cells, pyknotic nuclei, indistinguishable from the smear of pregnant women. This phenomenon is clinically noticeable as a creamy white discharge, rarely mixed with blood from the cervix. A few days after birth, regression of the hyperplastic epithelium sets in and a normal infantile vaginal mucosa develops. This phenomenon is found so regularly and is so striking that it has been suggested to make use of it for the objective determination of the age of a newborn baby. Less constant than the reaction of the vaginal epithelium is the swelling and secretion of the mammary glands in the newborn of both sexes (Witch Milk). Linea alba especially between the navel and mons veneris becomes pigmented in 8 per cent of the babies. This pigmentation, becoming visible at the age of three weeks, persists for two to three months. The succulence and sometimes even the swelling and the fold formation of the gums in newborns (sucking folds) have been compared to the hypertrophic gingivitis of pregnant women. Hormonal influence may account for the labia majora and the male genital of the newborn, which are often swollen and succulent. Other influences of pregnancy have been observed in the internal genitals of male and female newborns. Comedones and the false milia, i.e., the enlarged sebaceous glands and the sometimes observed acne of the newborn (also his vigorous lanugo growth) are often interpreted as hormonal pregnancy reaction. One has even spoken, in view of the numerous gonadal stimulations, of a "miniature puberty" of the newborn. The hypertrichosis of the newborn has also been called a parallel to the hypertrichosis of pregnancy.

Hygiene of the Skin of the Newborn

One of the standing nursery fallacies has been that every newborn infant requires an initial bath with soap and water. This custom was followed during the past by the infant's daily bath until his discharge from the hospital. This older concept was based on the premise that something should be done to the skin of the newborn infant because of the possible contamination acquired during passage through the birth canal. Such a routine, it was believed, would assure a hygienic skin that could be kept

8

The Newborn

THE NEWBORN PERIOD of life, as the term denotes, is the interval from birth to the end of the first month of post uterine existence The separation of the fetus from its mother and its coming to an independent existence expose it to many extrinsic influences to which it is as yet unaccustomed Altogether the adjustment of the infant to its new environment serves as a challenge to achieve continued existence. Nourishment, regulation of body temperature ingestion and digestion of food, elimination, secretion and excretion now function independently whereas *in utero* most of these functions were either inactive or passive Other physical and immunobiologic functions which were of minimal significance during the fetal period now assume greater importance The skin begins its independent functions as an organ of protection secretion and excretion. Also it must serve as a defense barrier against a bacteria laden environment

Characteristics of the Skin of the Newborn

The skin of a newborn is soft, smooth tender and of a velvety feel. At birth it is erythematous and covered by blood and by the vernix caseosa incident to delivery Soon after the baby is born the skin of his entire body assumes a heightened red appearance which has been likened to that of a boiled lobster Within a day the reddened surface becomes lighter and is replaced by the fine brawny desquamation familiar to all pediatricians and spoken of as the "peeling of the newborn. Gradually as the scales disappear the skin assumes a pinkish hue which is the characteristic color of the dermatologic network during the newborn period.

Wiener's histologic description of the skin in the newborn is given with such clarity that, with his courteous permission, we quote from it verbatim

> Microscopically the horny layer of the epidermis is very thin. The nuclei stain well throughout the epidermis. The papillae are flat but the papillary vessels are hyperemic. The tunica elastica of the blood vessels is well developed in contrast to the media and adventitia The other elastic fibers are still but little differentiated It takes about three years until the elastic reticulum is developed approximately to a state like that of the adult. The corium is rich in cells The fat cells have, in contrast to those of the adult well developed discernible nuclei. The Pacinian corpuscles are completely differentiated. In spite of the developed musculi arrectores pilorum, goose flesh does not occur in the newborn. The hairs are devoid of the medulla. The sebaceous and sweat glands assume their characteristic shape and full function only after the fourth or fifth month of extra-uterine life. On the other hand, secretion is present as early as the sixth month of embryonal life. Milia neonatorum are either enlarged sebaceous glands or cysts filled with desquamated horn cells. Insensible perspiration is greater and the acidity of the newborn's skin is lower than that of the adult. The average pH of 6 7 is close to the neutral point. The transition from fetal to extra-uterine life, which affects the whole system so profoundly is recorded in the growing matrix of the nails.

On the borderline of physiological and patho-

Wiener K. *Skin Manifestations of Internal Disorders* (St. Louis C V Mosby Company 1947)

they do not contain an excessive amount of alkali and that they are unscented. Perfumed soaps are contraindicated not only because they may sensitize the skin but also because they frequently act as primary irritants, predisposing the infant to secondary infection by traumatizing the skin. In any case, soap should be used sparingly and the skin should be thoroughly freed of all soap before the infant is returned to the crib.

Hard w ter contains chlorides and sulf tes and may injure the tender skin. Accordingly soft water only should be used for the newborn bath. The belief is that excessive cleansing of the skin with soap and water and the perpetual use of hard water tend to remove the natural fats so that the skin becomes dry hard and even fissured, particularly in infants with a tendency toward a dry skin.

The use of baby oils cream powders and shampoos.—One reason for the customary use of pure olive oil and baby oils after the infant's bath is to replace the oil lost through the keratolytic and drying effect of soap However in cooler weather bland, non-irritating oil, such as pure olive oil or sweet almond oil is permissible, although animal fats are to be preferred to vegetable oils and fats. Some dermatologists are opposed to the use of any form of oil on the baby's skin because oils frequently produce a blocking effect of the sebaceous and sweat ducts thus imprisoning pyogenic bacteria normally found upon the skin and often leading to infection (miliaria and pyoderma) This blocking effect may account for a persistent miliaria frequently seen among infants and may also be responsible for a bacterial allergy

During hot weather lubricants tending to increase the heat of the skin may be factor in producing an impetigo contagiosa For this reason I am definitely opposed to the use of so-called "antiseptic baby oils available upon the market Because such oils frequently contain chemicals such as oxyquinoline sulf te, they may either irritate the skin or act as sensitizers. Ther fore I seldom use mineral oil (Liquid Petrolatum U S P) as a cleansing agent. Instead I use mildly astringent remedy such as pure witch hazel (Hamamelis Water N F) hich is practically solution of alcohol and water (15 per cent of alcohol C_2H_5OH, by volume) Frequent spongings with witch hazel water after the bath serve to cool the skin and make the infant more comfortable by virtue of the fact that the alcohol contained in the preparation actually aids in the dissipation of heat.

After the customary full tub bath, the skin should be dried by gentle patting (never rubbing) with small pieces of gauze or a soft towel. A simple, nonmedicated, unscented talc may be used if desired. Because Starch U.S.P (Amylum, cornstarch $(C_6H_{10}O_5)n$) is a polysaccharide, ferments readily and forms an ideal soil culture medium in which bacteria grow especially during hot weather I seldom use it as a dusting powder even though it has a better absorbent action than talc. Starch cakes and, in the presence of moisture, is liable to irritate the delicate skin of the newborn. For these reasons I prefer a simple talc uncombined with any other medicaments, nonmedicated and without antiseptics.

In selecting powders to be applied by dusting only the finest grade should be selected The purpose of powder is to produce a soothing, cooling effect on the skin because powder like a lotion, may aid in the radiation of heat and evaporation through the epidermis. Talc by itself is not a good absorbent; accordingly inert earths, such as kaolin are added to it. The powder used for the infant's skin should be free from grit, from irritating particles and from "cake. The U.S.P talc (talcum) is known variously as purified talc, French chalk, soapstone and steatite.

Starch is commonly prescribed either alone or in arious combinations as a powder for the baby skin. There are different kinds of starch cornstarch (amylum) is official in the U.S.P but other starches such as potato starch, rice starch and maranta may be used especially when an infant is allergic to cornstarch as is infrequently the case. The disadvantages of starch are its fermentation and its tendency to cake around moist areas. Because starch is an excellent medium for the growth of bacteria, it is expedient to sterilize powders by heat in order to destroy any spores. Talc, kaolin and pre-

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Talc, U.S.P Talcum, purified talc is purified, native, hydrous magnesium silicate sometimes containing small proportion of aluminum silicate

relatively free from invasion by bacteria. It is only within recent years that the pediatrician's attitude with regard to these baths has changed and that nature's method of allowing the vernix caseosa to remain undisturbed has received the respect which it deserves. We now realize the importance of the sebum (vernix caseosa) and its protective character; i.e., as a protective membrane to the skin of the newborn infant, much as the stratum corneum which is absent at birth protects the skin in adult life. Furthermore, it has been found that skin infections are definitely reduced if the membrane is left intact for three to five days following birth.

THE USE OF SOAP AND WATER.—The American Academy of Pediatrics, in its Standards and Recommendations for Hospital Care of Newborn Infants, 1957 states:

> At present the consensus seems to be that the less done, the less danger of infection. No water or oil bath should be given during the hospital stay. Blood that has not been removed in the delivery room should be removed for esthetic reasons as soon as possible after the infant arrives in the nursery. Warm water and sterile cotton are recommended for this purpose.
>
> Vernix caseosa may have protective properties and will spontaneously disappear after a few days. Unsightly amounts may be removed gently with sterile cotton. Surgical gauze is not recommended for any phase of the routine skin care of the newborn infant because it is more irritating than cotton.
>
> The buttocks area may be satisfactorily cleaned with water. Oil should be used on the diaper area only and should be kept in a sterile glass container for each infant.
>
> Care should be exercised to keep the cord and umbilical area clean. No dressings should be used. Oozing from the cord stump should be removed with 70 per cent alcohol or benzalkonium chloride, and if persistent or associated with redness, it should be reported to the physician.

In cleansing the skin, particular attention should be given to the creases—the flexures of the groin, the axillae, the folds of the neck and the area behind the ears—since these regions frequently become the seat of an intertrigo.

CARE OF THE NEWBORN AT THE HOSPITAL.—*The rooming-in plan.*—Undoubtedly one of the most important factors which have contributed toward the reduction of infectious diseases in the newborn is the so-called "rooming-in" project, which is gaining popularity among obstetricians, pediatricians and mothers alike. Briefly the plan aims to remove newborn infants from a crowded nursery. Further, it enables the mother to keep a closer surveillance over her baby than is possible when he is given to her only at nursing time. Hamrick *et al.* state that since the rooming-in plan has been initiated at the Jefferson Hospital the incidence of skin infections has been considerably reduced. They report that from July 12, 1947 to February 12, 1949 2430 newborn babies were cared for in this fashion, 2 141 offspring of ward patients, 181 babies of patients who were cared for in a low cost semi-private ward and 108 babies of patients who were cared for in private and semi-private rooms. They report further that only one case of impetigo occurred among 4 000 babies housed on the maternity ward service at the bedside of the mothers during a three-year period. This case of impetigo was immediately isolated. There was no spread of the infection to other infants.

CARE OF THE NEWBORN AT HOME.—How soon after birth should the vernix caseosa be removed? Although opinions vary, a good general rule is that the infant's skin should be sponged with water anywhere between the third to the fifth day following birth. It is probably better not to use any soap because it has a pH of 9 and may therefore serve as an irritant to the sensitive skin.

After the infant is discharged from the nursery, he is given a full tub bath provided that he is not premature. A daily bath with a simple unscented soap is the general rule.

During hot weather the infant's skin should be sponged with cool water and then carefully dried by gently patting with soft gauze. Never should the skin be rubbed. The purpose of bathing and sponging is not only for cleansing but for the dissipation of heat which such treatment promotes as well as for keeping the sweat ducts from becoming plugged. The soap should be of a simple type. Ordinary castile soap consisting of pure olive oil and sodium hydroxide (Hard Soap U.S.P., Sapo Durus) is perhaps the most popular. However, most castile soaps no longer contain pure olive oil but have coconut oil added in order to increase their lathering property. Other soaps may be used provided that

erly dressed, but not overdressed. Another precaution is that during the hot season the child should never be placed in the direct rays of the sun for any prolonged period. For the summer cotton underwear is proper; for late fall, winter and early spring, 5 to 10 per cent wool underwear may be used, except for wool-allergic infants. It may be taken as a rule that if a healthy normal infant perspires excessively while showing no other unusual signs, he is overclothed.

O'Brien states that during the past, lipoid depletion of the skin, edema of the stratum corneum and poral infection, separately or in combination, have been ignorantly indicted for miliaria rubra. More accurately it would seem that a particular strain of staphylococcus aureus in the sweat pores is the important causative factor. Edema and an increased temperature of the stratum corneum operate as contributing factors in both miliaria rubra and impetigo.

Witch hazel water, because of the small amount of alcohol it contains, makes an excellent evaporating lotion for prevention and treatment of miliaria. It should be dabbed upon the skin daily, then followed with dusting of ordinary cornstarch (amylum) or a fine unscented talc; either will be conducive to the patient's comfort. Starch or an alkaline bath with bicarbonate of soda, or a bath with bran are helpful in overcoming skin irritation. The following dusting powder has been found serviceable:

℞
Calamine
Bentonite
Zinc oxide
Starch aa 30.0 Gm.
Misce et fiat pulvis
Signa: Dust upon the skin

Perianal Dermatitis

Perianal dermatitis of the newborn (Fig. 10) is characterized by an erythematous irritation of the skin about the anus, frequently accompanied by small superficial ulcerations. The latter lesions, seen particularly in the more severe types of inflammation, are often accompanied by an exudate (edema). The involved area, which is localized about the anus, varies in diameter from 3 to 4 cm., with the redness gradually fading at the periphery into the normal skin.

The cause is not definitely known. Pratt, in his study of 1349 babies, found that most cases occurred at between 3 and 7 days of age. He believes it is caused by the alkalinity of the stool of susceptible babies. He points out that infants with the most acid stool, that is, breast-fed babies, have the lowest incidence, while those fed on cow's milk and Dextri-Maltose have the greatest incidence of perianal irritation.

The *diagnosis* is based upon the localization of the lesions, the age and the absence of an ammoniacal odor of the diaper. The condition is



Fig. 10.—Perianal dermatitis in an infant 6 days of age. Note the erythematous plaque, especially on the right side, gradually fading into the normal skin. Close inspection disclosed several minute ulcerated lesions on the same area. (Courtesy of Dr. A. O. Pratt.)

most commonly confused with ammoniacal dermatitis (diaper rash). Diaper dermatitis, however, usually occurs in infants over 3 months of age and more frequently during the latter part of the first year, while perianal dermatitis occurs at the time of birth and increases in severity during the first week. The pungent, volatile odor of ammonia of the diaper is absent in perianal dermatitis. Further, ammoniacal dermatitis is limited to the convex surfaces of the thighs and buttocks, not infrequently involving the lower half of the abdomen, while the lesions in perianal dermatitis are localized definitely around the anus.

There are usually no complications. Healing ensues in a few days, although the condition may persist for two or three weeks.

Prophylaxis and Treatment.—Prophylaxis

cipitated chalk also may be sterilized by heat.

It is best to avoid the use of boric acid as powder ointment or wet dressing. Instances have been reported of death resulting from its absorption through topical applications as a wet dressing.

Shampooing of the hair is best achieved with a good grade soap adjusted to contain the absolute minimum of alkalinity on hydrolysis with water or by one of the newer soapless detergents.

Clothing

Because the skin plays an important part not only as a vital covering for the body but also physiologically in keeping the internal organs of the growing child adequately protected, the question of proper clothing is one that deserves careful consideration.

The standards and recommendations of the American Academy of Pediatrics for hospital care of newborn infants are as follows:

> It is recommended that only one piece of cotton clothing besides the diaper be worn, such as a gown open in the back or with side tie. Buttons should not be used on the newborn infant's clothing. The diaper should be of soft material. During hot weather in nurseries which are not air-conditioned, infants may be most comfortable wearing only a diaper. An adequate supply of clothing, bed pads, sheets and blankets should be kept at the bedside.

Usually infants are either overclothed or insufficiently clothed. The selection of proper clothing is just as important as the selection of proper food, hours of sleep, general regulations and habits. Since the skin surface of the infant is relatively larger than that of the adult, it should have greater assistance in the maintenance of body temperature. It has been found by Cohen that from 75 to 85 per cent of heat loss occurs through the skin either by evaporation of perspiration or by radiation and conduction.

It should be remembered that the infant's heat regulatory mechanism is labile. For this reason infants soon after birth are unable to maintain a constant body temperature under varying conditions of heat and cold. In fact, they are very like small hibernating animals who spend most of their time in sleep, obtaining nourishment in their cribs or beds, under bed clothes. Metabolism goes on at a much slower pace in the newborn than in the older, more active infant.

Care and Laundering of Soiled Linens

The recommendations of the American Academy of Pediatrics in 1957 are as follows:

> Soiled diapers should be placed in a special diaper can separate from the hamper used for soiled clothing and bed linens. Diapers should never be rinsed in the nursery.
>
> Soiled linen should be collected at least twice daily, preferably more often. The diaper can and the soiled linen should be put outside the nursery so that the collector need not enter. Diapers and soiled linen should be taken to the laundry without being being removed from their respective bags.
>
> Diapers and other soiled nursery linens should be washed separately from each other and from other hospital linen. Special care is needed in the washing so that the garments will remain soft and will be free from any substance that might irritate the infant's skin, such as strong soaps or chemicals.

THE COMMON DERMATOSES OF THE NEWBORN

Miliaria or Prickly Heat

Miliaria arises from the overheating of rooms and excessive clothing. Its elimination is achieved by reducing the room temperature and using less oppressive clothing. In summer the infant should receive frequent cooling baths; in winter he should not be overclothed. Strangely enough, it is among the underprivileged who can least afford the garments, that the notion still prevails that the infant must be kept surrounded with several layers of underclothes and covered with one or two blankets. Of course every care should be taken that the child's room is properly heated and ventilated. It should not be overheated. A good temperature that can be easily raised or lowered is 70 degrees F. Similarly, the child should be prop-

Seborrheic Dermatitis of the Scalp
(Cradle Cap or Milk Crust)

The scalp in infants has been found to be the most neglected part of the skin area. Either it is not washed frequently enough or it is not supplied with sufficient oil after washing. One of the commonest reasons for the failure of mothers to cleanse the scalp of the newborn is that they are afraid of injuring the anterior fontanel. Seborrheic dermatitis is particularly likely to appear in overfed babies.

The scalp may be partly or completely covered by thick, greasy yellowish brown crusts and scales. Other seborrheic areas, such as the skin over the eyebrows, the nasolabial folds and the posterior auricular area, may share in the process. Management consists in avoiding the use of soap and water which often worsens the condition. Instead, bland emollients are indicated, such as olive oil (sweet oil) petrolatum, or sweet almond oil, which at the same time are detergent. Mothers common practice of combing away the crust with a fine-toothed comb should be discouraged. The condition calls for the use of keratoplastics and keratolytics both in management and prophylaxis. A prescription I have used with considerable success is the following

℞

Salicylic acid (3%)	0.97 Gm.
Precipitated sulfur (3%)	0.97 Gm.
Petrolatum q.s. ad	30.0 Gm.

Misce et fiat unguentum
Signa: Rub into the scalp three times daily

See also Chapter 12, Maculopapulosquamous Diseases.

Scabies

Scabies is occasionally seen in the newborn and is invariably acquired from the mother or some other member of the family. In nurslings, scabietic lesions may be found on the face and even the scalp, but especially on the palms and soles in the form of papules, vesicles and vesicopapules. Scratch marks are absent. Secondary infections may then occur in which case the original scabetic condition may be overlooked. When a clinical diagnosis is not readily made, history of scabies in other members of the family is often helpful. Management consists in treating all members of the family at once by means of scabeticidal remedies.

See also Chapter 20 The Zoonoses.

Toxic Erythema of The Newborn

This is characterized by the appearance of small isolated areas of redness, varying in diameter from a few millimeters to 1 or 2 centimeters, in the center of the erythematous area of which is a small, whitish or yellowish-white wheal, raised, resembling a flea bite (Fig. 11). The urticarial lesions seen in some newborn infants suggest an allergic origin, perhaps a reagin absorbed from the digestive tract or a hormone transferred to the infant through the placenta or the breast milk is responsible. Further Parmelee suggests that trauma may play a part in its occurrence since the distribution of lesions corresponds to the areas of the skin surface where pressure and irritation are most marked, for example, the diaper area, back and shoulders. The lesions vary in number. They may be numerous and they are sometimes closely packed together in an area or part of the body but they are more commonly seen in the diaper area and on the back. The earliest lesions often appear during the first 24 hours. The individual lesions disappear after a few hours but new ones show up in successive crops for several days, in some instances even up to the time the infant leaves the hospital at 7 or 10 days. There are no signs of illness, and the infants progress like any other infants. No treatment is necessary

Congenital Syphilis

This form of syphilis is uncommon today in the newborn. The routine serologic testing of all prospective mothers now required by state laws and the use of penicillin have practically eliminated the incidence of this disease, which once took high toll of newborn infants.

The disease is caused by the *Spirochaeta pallida* and is transmitted to the child by the infected mother during pregnancy. The symptoms

consists in maintaining proper cleanliness of the perianal region, which may be accomplished by using sponges of absorbent cotton moistened with warm water or liquid petrolatum Care should be taken to remove the fecal matter at each diaper change

For treatment of the dermatitis cod-liver oil ointment* may be used. For the more severe types of the condition the diaper is removed and the infant left on its abdomen without it Then a lighted 100-watt incandescent bulb placed 18 in. (46 cm) above the buttocks will prove an excellent adjuvant

Intertrigo

Intertrigo of the buttocks and other areas *due to the effects of heat moisture and chafing* is seen particularly in fat babies. The sweat secretion contributes partly to the condition and, as the skin becomes macerated raw surfaces are often left exposed. Chafing is seen especially in areas where two opposing skin surfaces come in contact i.e the groins, intragluteal cleft and axillae Prophylaxis constitutes the most important control Proper washing and ironing of diapers and changing of soiled diapers at frequent intervals during day and night are important (For further discussion see Chapter 10)

Impetigo Contagiosa Neonatorum

Under this title three types of impetigo are subsumed (1) pyoderma pustulosis neonatorum (a term proposed by Parmelee because the lesions as pustules do not truly resemble impetigo as it is known in older children and adults) (2) impetigo contagiosa of the newborn infant and older infant (3) *dermatitis exfoliativa* (Ritter s disease) All these types share a common bacteriologic factor namely the staphylococci.

The primary lesion of impetigo contagiosa is a vesicle which soon becoming filled with a clear serous fluid that becomes seropurulent, then ruptures and dries, leaving a crust. The bullous type of impetigo contagiosa is supposedly caused by the staphylococcus, the dry crusted variety is due to secondary invasion by the streptococcus. The lesions of impetigo contagiosa appear upon a normal or slightly erythematous skin and vary in size from small pea to walnut. After rupturing the exposed area appears angry (erythematous) and forms crusts. The lesion may appear upon any part of the body during infancy although the palms and soles are usually exempt an important point for differentiating it from congenital syphilis.

Dermatitis exfoliativa neonatorum of the newborn is a highly contagious bullous impetigo of the newborn and may be accompanied by constitutional disturbances. It was first described by Gottfried Ritter von Rittershain in 1878 and hence is called *Ritter s disease* It is also referred to as keratolysis neonatorum. Sometimes it is confused with Leiner s disease (erythroderma desquamativa)

Since spread of impetigo contagiosa in nurseries has been attributed to poor aseptic technics, the control of the disease rests largely in prevention. The simple procedure of leaving the layer of vernix caseosa on the skin of the newborn seems to be an effective prophylactic measure. The disease is highly infectious. Overcrowding of nurseries, shortage of nurses, laxity of rules regarding visitors and similar conditions all have been incriminated in the spread of epidemics. There is no doubt that attendants can act as carriers and a carrier condition may exist in the infant s nose. Concurrent infections may occur

When a case of impetigo occurs, the following steps should be carried out. (1) The infected child should be isolated. (2) The contagious nature of the disease should be explained to parents and family (3) All linens, dressings, bedclothes, etc should be boiled or sterilized after use. (4) Physicians and nurses in attendance should use very careful aseptic technics. (5) Special attention should be given to the patient s nasal discharge.

Treatment of the disease is discussed in Chapter 15 *The Pyodermas*, along with its etiology diagnosis, differential diagnosis and treatment.

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* Examples of cod-liver oil ointment are A and D Ointment. This ointment contains vitamins A and D derived from fish liver oils. Desitin ointment contains cod-liver oil, zinc oxide talcum, petrolatum and lanolin.

therapy of choice. The dosage schedule for treatment of early congenital syphilis consists of penicillin in aqueous solution 10,000 units per pound of body weight for 10 days, or a repository form of penicillin, as, for example, procaine penicillin G in oil with 2 per cent aluminum monostearate. The latter may be administered in dosage of 10,000 units per pound of body weight for 10 days or else 15,000 units per pound of body weight every 3 days for 8 injections. Instead, 40,000 units per pound of body eight may be given weekly for 4 weeks. This schedule holds for children up to 2 years of age. The earlier treatment is started, the better will be the response. Every effort should be made to secure adequate pediatric management and to see that the infant obtains a well balanced and nutritious diet and that body fluids and electrolyte balance are kept up at all times.

See also Chapter 18.

Localized Areas of Edema

A pitting edema over the mons veneris or the dorsum of the feet or hands is common in otherwise healthy full-term infants and may persist for days. It has no clinical significance and disappears spontaneously requiring no treatment.

Omphalitis

Omphalitis is comparatively rare condition. It is due to careless aseptic technic in caring for the umbilical stump Complete healing of the umbilicus usually occurs in most infants after a week or ten days. Delayed healing is usually due to infection of the wound by he molytic streptococcus or the staphylococcus aureus. The signs of infection consist of serous or purulent discharge, which may be blood tinged A granuloma is often present. Treatment consists in the use of wet dressings of silver nitrate (0 1 per cent) or wet soaks of potassium permanganate (1 10 000) Granuloma of the umbilical cord responds satisfactorily to a *few* applications of lunar caustic (fused silver nitrate) Polyps of the umbilicus are treated by cauterization, ligation or the pplication of silver nitrate stick.

Contact Dermatitis

(Dermatitis Venenata or Neonatal Dermatitis)

A dermatitis caused by the use of perfumed baby oil containing antiseptics, such as oxyquinoline sulfate, and highly perfumed toilet soaps, is one of the most common causes of acute folliculitis in the newborn. The condition disappears as soon as use of the baby oil or toilet soap is discontinued. Instead, olive oil or sweet almond oil should be employed to lubricate the skin. For an acute dermatitis, wet dressings of chamomile tea are indicated during the edematous stage or a simple, soothing evaporating lotion containing zinc oxide, talc, bentonite witch hazel water and calcium hydroxide solution may be used.

Icterus Neonatorum

In newborn infants with icterus neonatorum, or physiologic jaundice, the jaundice usually begins on the second day after birth reaches its height on the fourth day and then gradually subsides. On the other hand, it may continue until the tenth day or the second week, but seldom longer except in premature and debilitated infants. Icterus neonatorum is supposedly due to an inverse hemolysis of the red blood cells, poor liver function, or both. The skin and sclera show yellowish discoloration. The infant is otherwise asymptomatic. The urine does not contain bile and there is no elevation of temperature, but the bilirubin of the blood is increased.

When jaundice persists longer than two weeks following birth, further studies are indicated to determine whether it has pathologic significance (e.g absence of bile ducts, congenital syphilis) Icterus that is due to congenital syphilis is associated with an enlarged liver and spleen, a history of syphilis in one or both parents, and the other signs and symptoms of syphilis in the newborn. Roentgenologic examination of the long bones is of definite help in making an early diagnosis of syphilis. The Wassermann reaction is frequently negative during the first few weeks or month following birth. Treatment for physiologic jaundice is not indicated.



Fig 11.—Toxic erythema of the newborn. A, noninfected pustular urticaria neonatorum in a 3-day old infant. Compare with B a staphylococcal pyoderma in an infant of the same age (By permission from Finlay H V L and Bound, J P Arch. Dis. Childhood 28 404-408 Oct 1953)

usually appear in the infant within two or three weeks after birth, although they may remain latent for as long as two years. The infant with syphilis is not usually very ill at first. There may be a mild fever listlessness, stupor and occasionally convulsions A refusal to take the customary feeding, resulting in loss of weight, is sometimes noticeable. The facial expression is quite characteristic, the skin of the forehead being wrinkled with an "old man" appearance. There is a characteristic rash, usually erythematous or macular which appears on the buttocks, extremities, face and sometimes palms and soles. This rash is often localized on the mucocutaneous areas such as the mouth and nose. The color of the eruption varies from a light yellow to deep brown or copper There is frequently a purulent nasal discharge known as *snuffles* which is an important diagnostic sign. A continuation of this sign for two weeks or more should arouse suspicion of congenital syphilis. Onychia and paronychia may be present and these sometimes affect all the nails, which become dry opaque and finally atrophic. Condylomata are rarely seen in this early stage A few other signs of congenital syphilis seen in the newborn are syphilitic alopecia enlargement of the liver and spleen, syphilitic meningovascular lesions, rhagades and certain skeletal changes including osteitis.

Many of the above symptoms and signs are similar to those in other skin disorders and should be differentiated from them. The simplest method of diagnosing congenital syphilis in the newborn is the elicitation of a history of syphilis from the mother and positive results from serologic test in mother or father

The best form of therapy is preventive. This is accomplished by making the serologic test on a pregnant mother and treating her with penicillin if infected For active treatment of the infant the administration of penicillin is the

therapy of choice. The dosage schedule for treatment of early congenital syphilis consists of penicillin in aqueous solution 10,000 units per pound of body weight for 10 days, or a repository form of penicillin, as, for example, procaine penicillin G in oil with 2 per cent aluminum monostearate. The latter may be administered in dosage of 10,000 units per pound of body weight for 10 days or else 15,000 units per pound of body weight every 3 days for 8 injections. Instead, 40,000 units per pound of body weight may be given weekly for 4 weeks. This schedule holds for children up to 2 years of age. The earlier treatment is started, the better will be the response. Every effort should be made to secure adequate pediatric management and to see that the infant obtains a well balanced and nutritious diet and that body fluids and electrolyte balance are kept up at all times.

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soon after is generally subcutaneous fat necrosis. The circumscribed areas are freely movable under the underlying tissues. With time the indurated areas tend to liquefy and are then absorbed and disappear completely. A history of difficult labor or use of forceps is frequently helpful. The condition must be differentiated from sclerema neonatorum (sclerema adiposum) sclerema edematosum and scleroderma. The characteristics of each are summarized in Table 11 along with details of management and other features.

TABLE 11.—SUBCUTANEOUS INDURATIONS OF THE NEWBORN: THEIR DIFFERENTIAL DIAGNOSIS, PROGNOSIS, MANAGEMENT AND OTHER FEATURES

	SUBCUTANEOUS FAT NECROSIS OF THE NEWBORN	SCLEREMA NEONATORUM	SCLEREMA EDEMATOSUM	SCLERODERMA
Synonyms	Adiponecrosis subcutanea neonatorum, sclerema adiposum in patches, lipophagic granuloma, obstetric lipophagic granuloma (Wertheim), subcutaneous fat sclerosis in nurslings, subcutaneous fat necrosis in nurslings, curable cutaneous induration of the newborn	Sclerema adiposum, edema neonatorum sclerosum	Edema neonatorum scleredema, scleredema	Hidebound disease
Etiology	Trauma (?) difficult labor, forceps, violent resuscitation of newborn, anoxia, intense cold (?) cases have followed cesarean section	Unknown	Unknown	Unknown
Possible contributing or predisposing factors	Low olein content of subcutaneous fat of the newborn	Debilitation and prematurity in infants; malnutrition, severe infectious disease, circulatory stasis, gastroenteritis with dehydration	Prematurity and debilitation in infants often associated with gastrointestinal disturbance (diarrhea) Foundling institutions	(?)
General health of infant	Full-term babies well nourished, large size and in good health	Poor weak and premature infants	Poor	Good
Onset	First few weeks of life (2 to 20 days)	Sudden Usually 3d or 4th day following delivery (within the first two days following birth)	First few days following birth (? to 4 days)	Very rare in infancy especially first two years

continued

Paronychia of the Fingers and Toes

This condition not infrequently seen in new born infants occasionally may be responsible for a generalized infection. A syphilitic paronychia is *characterized by nails that are frayed or tufted* there is inflammatory evidenc around the nails and at the edges of the nails Other signs of congenital syphilis are also pres ent. Treatment consists in keeping the nails and edges soft by applications of petrolatum. Syph ilitic paronychia calls for antisyphilitic therapy

SUBCUTANEOUS INDURATIONS OF THE NEWBORN

The four principal types of subcutaneous induration, according to Howard Fox are (1) adiponecrosis subcutanea neonatorum (subcutaneous fat necrosis) (2) sclerema adiposum (sclerema neonatorum) (3) sclerema edematosum (edema neonatorum scleredema) and (4) scleroderma. This system of classification will be followed here because of the confusion that exists under the present nomenclature wherein edema neonatorum is a feature in three different conditions (1) edema neonatorum (2) edema neonatorum sclerosum or sclerema neonatorum or sclerema adiposum, and (3) subcuta neous fat necrosis.

Subcutaneous Fat Necrosis

Subcutaneous fat necrosis is a benign disease of newborn and young infants characterized by deep-seated indurated areas in the subcutaneous tissue. The most important cause is trauma which results essentially in necrosis of the fat cells. Specifically the predisposing factor is the low olein content of the subcutaneous fat of the newborn. Subcutaneous fat necrosis has oc curred in some infants after a difficult labor in others it has followed violent resuscitation and anoxia On the other hand, several cases have been reported in infants born by cesarean section with no apparent trauma and no evi dence of anoxia. Intense cold may be a causative agent for example in the old fashioned method of resuscitating infants by pouring cold water on them At least one investigator believes the fat cells may be damaged by toxic agents.

Histopathology.—The histopathologic picture is distinct. The entire subcutaneous tissue is involved while the epidermis and corium either remain normal or show unimportant changes. *As already stated the process is char acterized by necrosis of the fat cells.* There is also an infiltration of the subcutaneous tissue by lymphocytes epithelioid cells, foreign-body giant cells and, occasionally eosinophils. Considerable edema is seen between the fat cells. The protoplasmic meshes of the fat cells become thickened and contain elongated, needle-shaped clefts, either in a wheel-like arrangement or in rosettes. The clefts represent fat crystals, supposedly those of palmitin stearin.

Clinical Picture.—The infants are usually well nourished large and of good weight The *lesions, which may be symmetrical or unilateral,* are deep seated and consist of painless indurated masses. They are seen at any time from 2 to 20 days after birth They vary in size from a pea to an egg and may cover the entire back and but tocks. At first they are a bluish-red color which gradually fades into that of the normal skin as improvement takes place. The interesting fea ture of the induration which extends into the subcutaneous tissue is that it does not pit on pressure. The border of the lesions is well de*fined and the overlying skin is smooth. Smaller* nodular masses may be movable. The indurated masses become absorbed and completely disappear in three to four months. The general health is good and remains good the infant thrives and gains weight satisfactorily This is an impor tant point in differentiation from other closely related conditions. The areas of predilection are the back (shoulders) arms, thighs, cheeks and buttocks. The palms, soles and abdomen are never affected. There is no elevation of temper *ature nor are there constitutional symptoms.*

Diagnosis.—A small or large sharply cir cumscribed, deep-seated indurated area of the skin presenting a wooden or rubbery hardness and generally localized on the back (shoulders) cheeks, arms, thighs and buttocks (in the order named) and appearing at the time of birth or

TABLE 11.—SUBCUTANEOUS INDURATIONS OF THE NEWBORN, THEIR DIFFERENTIAL DIAGNOSIS, PROGNOSIS, MANAGEMENT AND OTHER FEATURES (continued)

	Subcutaneous Fat Necrosis of the Newborn	Sclerema Neonatorum	Scleredema [illegible]	Scleroderma
Prognosis	Good. Disappears after 3 or 4 months	Poor. When not generalized recovery may follow	Mild cases recover. Extensive cases are followed by death in 4 or 5 days	Good. Clears up slowly after one or more years
Histopathologic features	Epidermis and corium normal. Necrosis of fat cells. Marked inflammatory reaction. Large number of *foreign body giant* cells (more than in sclerema neonatorum) (Lever). Protoplasmic membranes of fat cells thickened and contain elongated needle-shaped clefts in leaf-like arrangement or in rosettes (palmitostearin)	A stone-like hardness of the fat. Thickening of the connective tissue bands	Marked edema of skin, subcutaneous tissues and underlying muscles together with nonspecific inflammatory changes	In localized type collagen bundles are swollen and homogeneously edematous. Inflammatory infiltrate. Later flattening of epidermis
Management	"Masterful inactivity." Condition clears spontaneously	Corticotropin (ACTH) and cortisone. Antibiotic therapy. Parenteral fluids for dehydration	Corticotropin (ACTH) and cortisone worth trial	PABA should be given trial (Zarafonetis)

Clinical Course, Prevention and Treatment.—Calcification and cyst formation of the lesions may occur as complications. Slight atrophy of the subcutaneous tissues may follow in the exceptional instances. The prognosis is good. There is progressive gain in weight and, with absorption of the indurated areas, which begins after a month, the skin returns to normal in three to four months. Although the exact etiology is poorly understood, an effort should be made to prevent any trauma in difficult labor or by the use of the forceps. Heroic measures for resuscitation of the newborn are no longer necessary. After birth the infant should be carefully covered with warm blankets and a proper temperature maintained in the nursery. The condition runs its course; meantime nothing should be done which may harm the infant.

Sclerema Neonatorum

This condition is an uncommon disease that is also known as sclerema adiposum. It is characterized by a diffuse hardening of the subcutaneous tissues. The exact etiology is unknown. The condition has occurred in premature infants, in debilitated infants and in infants with gastroenteritis associated with diarrhea, especially when dehydration is present. Other associated factors include circulatory stasis, congenital heart disease and intracranial hemorrhage. The onset is sudden and occurs usually on the

TABLE 11 —SUBCUTANEOUS INDURATIONS OF THE NEWBORN: THEIR DIFFERENTIAL DIAGNOSIS, PROGNOSIS, MANAGEMENT AND OTHER FEATURES (*continued*)

	SUBCUTANEOUS FAT NECROSIS OF NEWBORN	SCLEREMA NEONATORUM	SCLEREMA EDEMATOUS	SCLERODERMA
Clinical picture	Lesions usually symmetrical (may be unilateral). Indurated sharply outlined painless *masses not attached to deeper tissues.* Process is *localized. Skin* bluish red gradually fading into normal skin as improvement occurs	Indurated areas of the skin are attached to deeper tissues. Skin appears dry smooth, *livid purplish* or dull yellow (jaundiced). Cold and *shrunken* wax like appearance. A diffuse rapidly *spreading* non edematous hardening of the subcutaneous tissues	Localized swelling of dependent portions of body. Edema may be extensive	Localized. One or more round or irregularly shaped smooth indurated patches, ivory color
Pitting of skin on press	No	No	Yes. Firm pressure by *fingers* leaves characteristic pitting slow to disappear	No
Involvement of palms soles of feet and scrotum	No	No	No	Not as a rule
Rigidity	Absent	Present. Boardlike stony hard, cadaveric, frozen, hidebound	None	None
Distribution of lesio	Over bony prominences, arms, back (shoulders), buttocks, thighs, cheeks	First the lower extremities (calves) then spreads upwards to invol buttocks, abdomen, chest, back forearms, in an ascending manner	Dorsal surfaces of feet calves, thighs, mons pubis, upper extremities, eye lids	Face, scalp, forehead, trunk, extremities
Constitutional symptom	None	Drowsy infant is wakened *with* difficulty	None ( )	None
Temperature	Normal	Subnormal	Normal	Normal
Complication	Calcification of lesions occasionally	*Immobility of joints* interferes with activity respiration and sucking. Coma and death in a few days	None. *Immobility* lacking or entirely absent	None in localized type

(continued)

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third or fourth day following delivery but within the first two weeks after birth Clinically the disease is characterized by a diffuse rapidly *spreading, non-edematous hardening of the subcutaneous tissues which begins in the lower extremities*, especially the calves, and spreads upward to involve the buttocks abdomen chest, back, forearms and face in an *ascending manner* possibly to involve the *entire body except* palms, soles and scrotum In some extensive cases, the boardlike rigidity of the body *is so marked that the infant can be picked up by one* extremity and lifted. The skin has a waxy or tallow like hardness and, on prodding feels like that of a cadaver It cannot be picked up or freed from the underlying tissues like normal skin being bound down to the underlying tissues muscle and bone. The skin of the affected area is smooth and of a livid *purplish dull yellow or mottled color However the indurated* areas do not pit on pressure as they do in sclerema edematosum In milder cases, when the condition is not generalized, recovery ensues. In severe cases immobility of the joints, because of its interference with activity even of respiration and sucking is followed by coma and death in a few days Histopathologic study will disclose a *streamlike hardness of the fat—a thickening of* the connective tissue bands. There is no specific therapy although corticotropin (ACTH) and cortisone should be given a trial Measures should be taken to combat infection (antibiotic therapy) and to restore the body fluid after dehydration.

Sclerema Edematosum

(Scleredema)

This condition seen in weak and premature infants is often found associated with gastrointestinal disturbances It usually occurs early after two to four days of life. Edematous swelling of the dorsum of the feet thighs, mons pubis, upper extremities and eyelids, is the prominent symptom *As is true in any true edematous* state pressure on the parts affected results in pitting, which disappears slowly The sharply circumscribed, indurated plaques seen in subcutaneous fat necrosis are never seen in this condition and there is never the boardlike hardness of the parts affected resembling that of a frozen *cadaver that occurs in sclerema neonatorum.* The edema may be localized or extensive. Patients with mild cases recover When extensive involvement occurs, death usually follows in four or five days. Histopathologically the epidermis, corium, subcutaneous tissue and even the underlying muscles show evidence of an intense edema together with nonspecific inflammatory changes. *There is no specific therapy for* the condition although the corticotropin hormone (ACTH) and cortisone should be given a trial.

Scleroderma

(Hidebound Disease)

Scleroderma of the newborn infant is so *rare only three authentic cases having been reported* in the literature that it need only be mentioned in passing. Hamburger claims that scleroderma has not been observed before the second year of life. In the few cases that have come to autopsy lesions in the cutis resembled those of scleroderma in adults. Biopsy failed to disclose any changes in the fat tissue The *condition clears very slowly after a year or longer* Zarafonetis has had successful results with PABA in early cases of the disease

See also Chapter 14

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MANAGEMENT

An attempt should always be made to find the cause of itching (Table 12) and to eliminate the responsible factors whenever possible. This procedure is obviously of primary importance in the management. Thus, for example, when itching is caused by the acarus scabiei, antiscabietic

TABLE 12.—CAUSES OF ITCHING IN INFANTS AND CHILDREN

I. Parasitic infections
  a. Fungi
    1 Trichophyton
      Epidermophyton
    3 Monilia
  b Pediculi capitis, corporis, pubis
    Scabies, insect bites by mosquitoes, fleas and bed bugs, grain itch.
  d Pyogenic infection and focal infections: impetigo, ecthyma and pyodermas, appendicitis, athlete's foot; infected teeth, sinuses and tonsils
II. Dermatitis venenata group.—Contact dermatitis, ivy, sumac and poison oak. Woolen and rough underwear
III. Toxic erythema group.—Erythema multiforme, urticaria, toxic erythemas, drug rashes, serum sickness and dermatitis herpetiformis
IV The eczema-asthma prurigo group.—Atopic dermatitis or allergic eczema and neurodermatitis; lichen urticatus
V Certain papulosquamous eruptions.—Lichen planus, pityriasis rosea, psoriasis and seborrheic dermatitis
VI Certain constitutional diseases.—Diabetes, jaundice, kidney disease and endocrine disturbances (rare)
VII Erythema pernio (chilblains)
VIII Erythrocyanosis frigida crurum puellarum.—Most commonly seen in adolescent girls according to W N Goldsmith
IX. Degenerative and atrophic changes in the skin.—Pruritus hiemalis (winter itch) bath pruritus.
X Lymphoblastomas group.—Rare Leukemia, Hodgkin's disease and lymphosarcoma
XI Psychologic and neurogenic.—Pruritus associated with emotional states or under nervous strain.

Modified after [illegible] June, 1937

remedies are called for and all infected members of the household should be treated at the same time. So, too, in pediculoses, pediculicides and ovicides are indicated for optimum therapeutic results. However frequently the exact etiology remains obscure and then empirical methods for the relief of pruritus become necessary in order to give the patient relief and to secure his rest while the cause is still being determined.

In certain instances, strong alkaline soaps may tend to increase itching, particularly in dry skins. These soaps, then, are best avoided and their use should be replaced by other detergents (Chapter 6) such as the sulfonated soaps. Wet dressings (Chapter 6) because these are frequently serviceable as efficient antipruritics, deserve a trial, particularly during the acute stage of many dermatoses. Shake lotions are generally contraindicated for dry skins and emulsions (Chapter 6) which serve as antiphlogistics should be used in their place.

Recent investigations seem to show that the use of local analgesics is valueless for the relief of itching. According to Lobitz and Jillson, it seems generally agreed that regardless of the vehicle or the component parts of the prescription, none of the anesthetic or analgesic agents (e.g., procaine benzocaine, etc., phenol, menthol) is absorbed into the intact skin of the human in sufficient amounts to alter itch or pain sensation when topically applied. Further when the intact skin was injured (thermal radiation) there was no appreciable penetration of these drugs unless the surface was abraded.

With regard to members of the caine family it has been shown, with 12 different members of this pharmacologic group that, when injected intradermally high concentrations were required to inhibit itching. Of particular interest and importance is the hypersensitization of the skin that may be produced through the use of many of these local anesthetics. Thus, Lane and Luikart, reviewing 107 cases of epidermal hypersensitivity to local anesthetics, found that 78 cases (73%) were confirmed by positive patch tests. In decreasing order of case report frequency they are procaine, Orthoform, butamben (Butesin) picrate tetracaine (Pontocaine) dibucaine (Nupercaine) ethylamino-benzoate (Benzocaine) butacaine (Butyn) Apothesine, Larocaine and Piperocaine (Metycaine)

It is doubtful also whether the antihistaminic creams and ointments, when applied topically in ordinary bases, are useful in the treatment of pruritus. In this writer's opinion, they are useful only in that type of pruritus due to histamine such as urticaria and angioneurotic edema, and

9

Pruritus and Its Management

ITCHING IS ONE *of the most annoying* symptoms which dermatologists are called upon to treat. In some dermatoses, for example in atopic dermatitis (*or infantile eczema*") *itching* becomes a very distressing symptom causing restlessness, sleeplessness and incessant scratching. These difficulties usually *continue until itching* is minimized or eliminated entirely and indeed until such time, improvement in the skin eruption may not follow The *constant scratching* frequently promotes a secondary infection.

Pruritus in children may be divided into two types

Type 1 —Pruritus associated with various dermatoses, e.g. scabies, pediculosis insect bites, atopic dermatitis, urticaria, wool-sensitivity (contact dermatitis) various other contactants from without and allergens from within (foods) lichen planus, dermatitis herpetiformis.

Type 2 —Pruritus arising from the idiopathic" group of ailments i.e., those whose cause is not easily found

Lobitz and Jillson's description of the mechanism of itching can scarcely be improved upon

The itch is mediated by pain receptors and pain fibers and occurs when these receptors are weakly *stimulated.* When with local anesthetics, the perception of pain disappears, itching also disappears itch returns with the *return* of pain perception This has also been observed clinically in diseases with sensory *dissociation* (*syringomyelia*, leprosy etc.) i.e., itch is present only when pain is present. The nerve fibers for itch are carried *from the skin to the spinal cord in the peripheral nerves.* Within the spinal cord the fibers then travel up the spinal thalamic tracts to the thalamus and cortex. Stimulation of the higher centers can intensify itching, whereas certain types of sedation can decrease it. The itch cycle The normal reflex response to the itch sensation is to scratch. Scratching will relieve the itch by stimulating pain endings and thus converting the intolerable itching sensa*tion to the more tolerable pain sensation or* by breaking up the monotony of the nerve fiber response producing the itch *To accomplish the* pain, the skin obviously must be injured. The skin in turn must protect itself against any acute or chronic injury This protective response on the part of the skin is one of thickening and exaggeration of the normal lines and is accomplished by increasing the number of prickle cells and widening of the *surface—cornified layer of the epidermis.* Such a protective thickening in response to occupational *trauma is called a callus and to scratching is called* lichenification.

Scratching of the skin probably causes a release of histamine or a histamine-like substance which accounts for itching in some persons. The *late* Sigmund Greenbaum *and other* dermatologists have frequently referred to the reflex mechanism of itching in terms of pruritus habitus. *Once the habit of itching is established it* is hard to control. Too dry skin (xeroderma) is known as a frequent cause of itching. Treatment in the latter case depends on overcoming the cause of the dryness.

Lobitz W C J and Jillson, O F Postgrad Med 12 — J ly 1952

distillation. It occurs as colorless crystals (often large) or as a white, crystalline powder having an aromatic, thyme-like odor and a pungent taste. The best solvents include alcohol, chloroform, ether olive oil and fixed and volatile oils. It is sparingly soluble in water Thymol, a good antipruritic, may be prescribed in concentration of 0.25 to 1.0 per cent either as an ointment or in alcoholic solution.

℞
Thymol (0 25%) 0 15
Hydrous wool fat 8 0
Petrolatum q.s. ad 60 0
Misce et fiat unguentum
Signa: Apply p. r. n.
Indication. Pruritus—older infants and younger child

Chloral Hydrate U.S.P. (Chloral)

Prepared by the action of chlorine on alcohol, it occurs as colorless or white crystals having an aromatic, penetrating, slightly acrid odor and a bitter caustic taste. It is quite soluble in water also in alcohol, chloroform, ether and olive oil. It should not exceed 3 per cent strength for children.

℞
Chloral hydrate (1 3%) 1 8-5.4
Aluminum acetate emulsion
(Burow's emulsion) q. s. ad 180 0
Misce et fiat emulsion
Signa: Apply p. r. n.
Indication. Antipruritic, especially when skin is dry

Salicylic Acid U.S.P. (Orthohydroxybenzoic Acid)

Obtained from natural sources (e.g., birch or gaultheria oil) or made synthetically by treating sodium phenolate with carbon dioxide (Kolbe's process) It occurs as white, fine, needle-like crystals or as a fluffy white, crystalline powder The acid obtained from natural salicylate may have a slightly yellow or pink tint and a faint gaultheria-like odor It is sparingly soluble in water but quite soluble in alcohol and ether Salicylic acid is antipruritic in topical applications up to 3 per cent strength.

℞
Salicylic acid (0 5-3 0%) 0 6-3 6
Rose water ointment 120 0
Misce et fiat unguentum
Signa: Apply several times daily
Indication. Mild antipruritic for infants and children

Solution of Coal Tar U.S.P. (Liquor Carbonis Detergens)

Containing 20 per cent coal tar polysorbate 80 and alcohol, it is a reddish-orange, alcoholic liquid with a characteristic empyreumatic odor The tars depend for their antipruritic effect largely upon the phenols and cresols they contain. They may be prescribed as ointments, creams or lotions. Coal tar solution should not exceed 5 per cent in strength when used for topical application on children.

℞
Coal Tar Solution N.F (1 3%) 1 2 3.6
Rose water ointment
vel
Hydrophilic petrolatum 120 0
Misce et fiat unguentum
Signa. Apply several times daily
Indication. A mild, antipruritic ointment. Use w/ type of emulsion base is desired

Ichthammol N.F. (Ammonium Ichthosulfonate)

Ichthammol represents the ammonium salt of sulfonated hydrocarbons obtained by destructive distillation of certain bituminous shales containing a high proportion of sulfur the sulfonation of that distillate and the neutralization of that product with ammonia. It occurs as a reddish brown to brownish-black, viscous fluid with a strong characteristic empyreumatic *odor It is miscible with water glycerin and* fixed and volatile oils, but is only partially soluble in alcohol or ether Ichthammol is the mildest of the tars Another advantage possessed by ichthammol over other tars is that it contains sulfur It should not be prescribed in stronger concentration than 5 per cent for children.

℞
Ichthammol (1%) 0 9
Salicylic acid (0.5%) 0.45
Glycerin 8.0
Diluted alcohol q. s. ad 90 0
Misce et fiat tinctura
Signa: Paint on lesions several times daily
Indication. Mild antipruritic for infants and children

Ethyl Aminobenzoate N.F. (Benzocaine, Anesthesin N.N.R.)

The ethyl ester of p-aminobenzoic acid, occurs as small, white, odorless crystals or as a white crystalline powder It is sparingly soluble in water but soluble in alcohol chloroform,

valueless in treating the pruritus of many cases of atopic dermatitis.

Morphine, methylmorphine (codeine) and camphorated tincture of opium (paregoric) should not be administered to infants and children for itching since all remedies of this group *definitely aggravate the pruritus*. On the other hand acetylsalicylic acid (aspirin) and other salicylates such as sodium salicylate depress the post nerve roots of the spinal cord they therefore alleviate pain and at the same time the itching. Chloral hydrate one of the most valuable internal remedies for itching, has the advantage of a low index of sensitivity as well as being an efficient hypnotic. It may be prescribed alone or in combination with one of the salicylates for synergistic effect.

Topical Antipruritic Remedies

Shown below are a few representative prescriptions for each type of remedy. Others will be found in the Formulary Chapter 7 ℞ 11 12, 56 and 57.

Phenol U.S.P. (carbolic acid)

Consists of colorless crystals with a somewhat characteristic odor. It is soluble in water to the extent of 1 part in 15 parts very soluble in alcohol glycerin chloroform ether and fixed and volatile oils also in petrolatum and in liquid petrolatum. For the topical treatment of pruritus, phenol should not exceed 1 per cent for older children and 0.5 per cent for younger children. The following prescriptions represent various combinations.

℞
Phenolated Calamine Lotion U.S.P. 120.0
Misce et fiat
Signa. Apply several times daily
Indication. For older child (This lotion contains 1 per cent liquefied phenol.) Antipruritic, local anesthetic, antiseptic (for acute inflammatory dermatoses when associated with pruritus). It should be avoided when the skin is dry and lichenified.

℞
Phenol (0.25-1%) 0.3 1.2
Zinc oxide ointment
vel
Neo-calamine ointment
vel
Zinc oxide paste 120.0
Misce et fiat
Signa. Apply several times daily
Indication. For infants and children when a simple protective ointment or paste with an additive antipruritic is indicated. (Pastes are particularly indicated in the sub-acute phase of any exudative dermatosis)

Menthol U.S.P. (Peppermint Camphor)

A secondary alcohol obtained from peppermint or other mint oils or prepared synthetically. It occurs as colorless, hexagonal usually needle-like crystals or fused masses of a crystallized powder with a pleasant, peppermint-like odor. Menthol is a local analgesic supposedly because of its peripheral action of the sensory nerves. It may be prescribed either alone in a vehicle or in an ointment base, or combined with phenol the latter for its synergistic effect. The dose for infants and young children is 0.1 per cent, for older children 0.25 per cent.

℞
Menthol (1/10-¼%) 0.06-0.15
Rose water ointment
Zinc oxide ointment aa q.s. ad 60.0
Misce et fiat unguentum
Signa. Apply several times daily
Indicatio. Infants or children for dermatitis associated with pruritus

Camphor U.S.P. (Gum Camphor)

A ketone obtained from Cinnamomum Camphora (Linne) or produced synthetically. It occurs as colorless or white crystals, granules or crystalline masses or as colorless to white, translucent, tough masses with a penetrating characteristic odor. The best solvents include alcohol chloroform ether fixed and volatile oils. Camphor spirit N.F. containing 10 per cent camphor is useful for insect bites and stings accompanied by pruritus. Camphor may also be used in the form of ointments, pastes and vanishing creams. It should not be used stronger than 2 per cent for children.

℞
Camphor (0.5%) 0.3
Alcohol 4.0
Rose water ointment q.s. ad 60.0
Misce et fiat unguentum
Signa. Apply p.r.n.
Indication. Antipruritic, cooling cream

Thymol N.F. (Thyme Camphor)

Obtained from a volatile oil Thymus Vulgaris, and from some other oils by fractional

Other Measures

In a number of instances, this author has found autohemotherapy of considerable value in the management of itching. From 5 to 10 cc. of whole blood is taken from the median basilic or cephalic vein and introduced intramuscularly into the buttocks. This procedure may be repeated every third or fourth day. Too nonspecific methods, such as foreign protein injections (e.g. typhoid-paratyphoid vaccine) in small doses from 0.25 to 0.32 cc. may be administered subcutaneously once weekly for a total of three injections. Generalized exposures to ultraviolet light from a mercury vapor quartz lamp are sometimes of considerable help as adjuvant therapy.

When all measures have been tried without success, a change of environment, such as a sojourn at the seashore, is frequently helpful for child with atopic dermatitis. In recalcitrant cases of pruritus that have seemingly failed to respond to topical and systemic therapy, roentgen therapy in ¼ skin unit dosage should be tried for symptomatic relief and repeated once or twice at weekly intervals. This treatment should be carried out by a dermatologist who has had considerable training and experience with it. Recently Grenz (borderline) rays have been found especially useful for the treatment of intolerable pruritus. They possess the advantage that the treatment may be repeated without fear of possible sequelae and complications from repeated x-ray therapy. Finally, splinting of the elbows with cardboard well padded with absorbent cotton, or by other means, often becomes necessary in order to prevent further trauma to the skin from scratching and so give the sick skin a chance to heal. Various devices for restricting motion of the elbows are available but, in this writer's experience, they are no better than the improvised cardboard splints.

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Lobitz, W. C. J., and Jillson, O. F.: Postgrad. Med. 12:2, July 1952.

ether and olive oil Other closely related "caines" include nupercaine, pontocaine procaine hydrochloride and butesin These are local analgesics when prescribed as topical ointments creams and lotions. The disadvantage of ethyl aminobenzoate and its closely related compounds is that they have a relatively *high index* of sensitization. Benzocaine should not be prescribed in concentration exceeding 5 per cent for older children.

℞
Ethyl aminobenzoate (1 5%) 0 6-3 0
Hydrous wool fat 3 0
White petrolatum q.s. ad 60.0
Misce et fiat unguentum
Signa Apply several times daily
Indication Antipruritic for infants and children

Baths

Baths (Chapter 6) are frequently useful in the management of pruritic dermatoses because they serve for cleansing the skin as well as anti pruritic agents.

Internal Remedies for the Relief of Pruritus

Internal medication for pruritus may be given largely for a sedative effect and to quiet the child who has become highly *nervous or irritated* from constant itching. *Aspirin phenobarbital* and *sodium bromide* in proper doses are all effective The following prescriptions have been found most desirable by the author

℞
Acetylsalicylic acid 4 0
Potassium citrat 20.0
Orange syrup
vel
Raspberry syrup
Distilled water aa q.s. ad 90 0
Misce et fiat
Signa One teaspoonful every three or four hours. (Each teaspoonful contains approximately 2½ gr [0.16 Gm.] of aspirin)
Indication Sedative (This preparation remains stable only for as long as one week Accordingly it should not be ordered in large quantities)

See Formulary ℞ 116

Barbiturates

℞
Phenobarbital soluble 0.39
Orange syrup q.s. ad 90.0
Misce et fiat syrupus
Signa. One teaspoonful (contains approx. ¼ gr [0.015 Gm.] soluble phenobarbital) every four hours
Indication. Sedative. For children 5 years and over As a hypnotic dose, the patient should receive 2 or 3 teaspoonfuls

℞
Phenobarbital soluble 0.39
Lactose 3.0
Misce et fiat chartulae XXIV
Signa. One powder to be dissol ed in milk or fruit juice every four hours. (Each powder contains approximately ¼ gr [0.015 Gm.] soluble phenobarbital)
Indication. Two or three powders may be administered for hypnotic effect, for children 5-12 years of age

Bromides

Bromides because they depress the central *nervous system lessen excitability and irritability* They are best prescribed in combination with the barbiturates for synergistic effect. The following prescription illustrates such a combination

℞
Soluble phenobarbital 0.39
Sodium bromide 4.0
Compound Pepsin Elixir N.F q s ad 90 0
Misce et fiat
Signa One teaspoonful every four hours. (Each teaspoonful contains approximately ¼ gr [0 015 Gm.] of soluble phenobarbital and ½ gr [0 16 Gm.]) of sodium bromide
Indication. Sedative, for a child 4 or 5 years

The Antihistaminics

The antihistaminics, when administered per os, are of considerable value in most allergic dermatoses, but there is no general agreement as to which one is to be preferred. Individualization is necessary in order to determine the optimum therapeutic effect. In short, the successful use of the antihistaminic depends largely on a method of trial and error Sometimes, children do better when several antihistaminics are combined This effect is probably due partly to *their sedative action. For older patients* 50 mg tablets prove more convenient. At times a combination of equal parts of benadryl and pyribenzamine may be used. Pyribenzamine also gives relief to children with pruritus in measles

See Formulary ℞ 102, 111 112.

allergen (irritant) exerts its damaging influence and so sets in motion a cycle of changes which follow each other in ordered sequence. These changes occur for the most part in the epidermis, but the corium shares in them too. There are several ways in which the highly sensitized skin reacts to the allergenic agent, but first, for understanding, it must be realized that in atopic eczema the skin is different from normal integument in that it is predisposed, from the time of the infant's birth, to react in a peculiar manner. A large percentage of the parents of eczematous infants, when questioned as to the existence of an allergy among members of the immediate family or close relatives, admit themselves subject to the condition denominated by Stokes as the asthma-eczema-hay fever complex. In some studies of atopy a history of allergy has been found in as many as 40 to 60 percent of family members.

Some children may become sensitized by allergens during their intrauterine life or during nursing. Ratner and others have demonstrated that such sensitization actually does take place through the placenta and through breast milk. Once an infant has become so sensitized, he will always react to the presence of particular allergen by a regular train of symptoms and signs whenever he comes in contact with it.

The histologic picture of eczema in older children and adults is similar to that of infants except that in very young infants, the stratum corneum is thin so that there is lacking the resistance to the edematous fluid furnished by the strongly functioning corneal layer of the older person, with the result that vesiculation and bullous lesions occur much more frequently.

Soon after the allergenic agent has exerted its harmful effect upon the superficial blood vessels of the upper corium, the capillaries enlarge and fill with blood (erythema). The simple inflammatory exudate that surrounds these vessels (defense mechanism) consists of small round cells (small lymphocytes) and wandering connective tissue cells (histiocytes). After the primary insult to the vessels, an outpouring of serum takes place sufficient to invade the epidermis, clinically this constitutes the stage of edema. Histologically the edema is of the intercellular type that is, the prickle cells are not themselves particularly "water logged," but the interstices of the cells, especially the spaces between the prickle cells—those little "bridges" connecting one prickle cell with another—become the chief situs of the edematous change. Varying degrees of edema can be seen, dependent upon the mildness or severity of the eczema. Thus, in comparatively mild cases, the contour of the epidermis is fairly well retained and its staining property is only slightly affected. On the other hand, in moderately severe or severe cases the prickle cells and their staining property are altered and stain only lightly. This alteration, called spongiosis, may lead to the rupture of the prickle. When in turn these ruptures become confluent, the result is a vesicle or a series of vesicles. Increased serum to the epidermis means increased nourishment there and the result is the hypertrophy of the prickle cell layer and acanthosis. Happily the pathologic process in eczema is reversible so that under conditions of adequate therapy the edema may be made to subside and restoration of the normal skin follows in course.

Classification.—There are several classifications of eczema in infants and children that are confusing. The following is the best and most practical from a combined pediatric and dermatologic viewpoint.

A. Atopic variety
  1. Atopic dermatitis
  2. Atopic erythroderma
  3. Nummular eczema
  4. Circumscribed neurodermatitis
B. Contact variety
  1. Contact dermatitis, due to contactants of various kinds, e.g., rhus, chemicals, etc.
  2. Diaper dermatitis
  3. Intertrigo
C. Eczematoid dermatitis due to microorganisms
  1. Fungous (See Chapter 19)
  2. Non-fungous
D. Combinations of any or all of the above

In addition to the above types, atopic dermatitis over the seborrheic areas of the body and which becomes eczematized is sometimes seen. This variety is occasionally referred to as a "seborrheic eczema," but this writer prefers to call it atopic dermatitis with a seborrheic component.

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The Eczematous Dermatoses

THE TERM "eczema" derives from the Greek elements, ek and zeim and, literally translated means "a boiling forth." The clinical lesions and the various stages of the disease were named by the older dermatologists. For examples there are *eczema erythematosum* the stage of erythema *eczema papulosum* in which papular lesions predominate *eczema vesiculosum* characterized by vesicles *eczema pustulosum* by which is meant a pyodermatization of the eczema. *Eczema rubrum* means the intensely reddened markedly inflamed form of eczema that is characterized by oozing lesions often found covered by crusts. This last condition was often referred to also as *eczema madidans* (*eczema exudativum*) by the older clinicians. They are classified also according to location one reads occasionally of eczema of the hands scalp etc.

Eczema intertriginosum (intertriginous eczema, eczema intertrigo) is characterized by hyperemia caused when two skin surfaces or mucocutaneous surfaces are in constant apposition and between them there is retention of sweat. This condition familiarly known as chafing is frequently seen in the groins axillae and beneath the breasts in women. Finally may be mentioned mycotic or nummular eczema.

While the term infantile eczema is a poor one, common usage has adopted it and will probably retain it. The expression allergic dermatitis is no better since it tells nothing about the etiology except that the skin condition is an allergic one and is accompanied by an inflammation The term dermatitis itself means little to the dermatologist other than that the skin is inflamed but to him atopic dermatitis is a definite entity comprising certain well-defined changes in the histopathologic pattern of the skin. O Leary points out that neurodermatitis is a generic term which should be limited to dermatitis of psychogenic origin, such as neurotic excoriations, factitional eruptions pruritus ani and dyshidrotic eczema, and that such a diagnosis should be qualified by a designation of the type of the cutaneous lesion Further he states that the term "allergic dermatitis should be used "to designate unfavorable reactions of the skin due to the ingestion of food or a contact with chemicals plants or other factors and similarly the term allergic should also be qualified by designation of the irritant if demonstrated.

Pathogenesis.—Although from a practical point of view there exists no sharp line distinguishing the various phases of eczema one from another it is reasonable nevertheless to discuss the various manifestations seriatim in order to understand clearly the pathologic changes that take place in corium and epidermis.

All eczemas begin as an erythema. The shock organ in atopic eczema is located in the superficial blood vessels (the smaller capillaries and the arterioles) in the upper cutis It is at that point in the dermatologic network that the

the frequency of egg reactions in early infancy to intrauterine sensitization.

INHALANTS.—The inhalants responsible include wool, silk, feathers, kapok, rayons, dust, human and animal dander and other substances. Investigators such as Tuft, Epstein, and Rowe have reported that inhalant antigens play a role in the etiology both in adults and children. Improvement of the dermatitis was observed when therapy with extracts from antigens involved in the respiratory allergy was started Osborne and Walker reported examples of atopic dermatitis induced both by local contact and the inhalation of wool. More recently Osborne and Murray have stated that dermatitis develops in twice as many infants a month during the cold as in the warm months. They therefore concluded that this increased incidence is due primarily to exposure to wool both by contact and inhalation. Further they found that 75 per cent were much improved or entirely free of dermatitis during the summer months. Of 89 patients with chronic atopic dermatitis followed for 5 to 26 years, for 59 of the entire group or approximately two thirds, wool was shown to be the dominant allergenic factor Hill also reported cases of atopic dermatitis due to local contact with wool and to the inhalation of wool fiber

SEASONAL VARIATIONS.—In atopic dermatitis, the vascular system (or the superficial capillaries of the corium) is labile and, accordingly may be influenced by many factors acting extrinsically or intrinsically Precipitating factors, when brought into contact with the sensitizing organ, the corium, may initiate cycle of histopathologic event which is recognized clinically as an acute flare-up of the skin. *Pollens* such as ragweed and others, may serve as precipitating factors. In the case of pollens it is the oily fraction which comes into contact with the skin and is perhaps absorbed transepidermally The water-soluble fraction of airborne pollens may be absorbed by inhalation.

BACTERIA A D FUNGI —) Bacteria (Staphylococcus pyogenes) —From time to time, the staphylococcus and other pyogenic microorganisms have been incriminated in the etiology It is commonly believed that bacteria may influence the course of eczema.

— Fungi.—When Perlman tested 68 eczematous infants and children with five different fungous extracts, including oidiomycin and trichophytin 0.1 cc. intracutaneously in a fashion similar to the tuberculin tests (reactions delayed for 24 hours) there were no positive reactors. Scrapings and cultures were carried out; no pathogens were found. Accordingly this investigator concluded that fungous infections of the skin play little part in the eczematoid dermatoses.

PSYCHOGENIC CONCEPT.—While an unbalanced *sympathetic nervous system may serve to* explain the repeated flare-ups frequently seen in atopic infants and children, and while emotional stress, worry anxious anticipation—the last particularly common among students before school examinations—are generally recognized as having something to do with the recurrence *of the disease, many dermatologists are* inclined to regard them merely as precipitating factors.

The so-called *mother rejection complex* stressed by some psychoneurologists has not been accepted by most dermatologists This concept assumes that there is a failure on the *part of the infant to obtain from* his *mother* or mother substitute adequate soothing physical contact such as caressing and cuddling. Accordingly instead of being left alone "to cry it out, infants should be picked up and physical contact should be mainly by cuddling and general patting. The lack of cuddling and caressing in most cases studied was thought to be an important factor in causing eczema. Studies along this path of research have been carried out by Spitz and others.

EMOTIONAL STRESS.—Selye believes that the allergic or atopic diathesis should be included in the disease of adaptation, since these disorders may very well depend largely on a derangement of the pituitary adrenocortical response to stress.

NEUROVASCULAR INSTABILITY.—A working hypothesis by Williams is based *on the* autonomic vascular reaction. Williams found that the typical histologic picture of allergy may oc

*The criteria of pathogenicity are the production of coagulase and the fermentation of mannite. A staphylococcus without these properties is referred to as the staphylococcus albus.

ATOPIC VARIETY

Atopic Dermatitis (Infantile Eczema)

Coca coined the term "atopy" which may be defined as a type of allergic hypersensitiveness appearing in human beings but not in lower animals and characterized by a strong hereditary disposition as shown in the eczema asthma-hay fever complex.

The atopic dermatitides include so-called "infantile eczema" and disseminated neurodermatitis, conditions that are now considered to be the same. Some prurigos and urticarias also fall into this classification. The prurigo diathesique of Besnier that is seen in older children and adults belongs to this group In older children and adults neurodermatitis disseminata, the late exudative eczematoid of Rost and the prurigo diathesique of Brocq are also frequently encountered.

Characteristics of Atopy

1 *A hereditary predisposition due to constitutional abnormality* A familial history of allergy exists i.e. subjects stem from families in which several members of the same family have a tendency to become sensitized. Stokes has referred to such individuals as belonging to the group of "the asthma-eczema-hay fever complex."

2 *The Prausnitz Küstner phenomenon* There are present antibodies differing in certain respects from precipitants and from all other known antibodies. These are usually designated as Prausnitz Küstner antibodies or atopic reagins. These antibodies in the serum can be demonstrated by the *Prausnitz Küstner passive* transfer test.

3 *Hypersensitivity of the shock organ located in the corium.* Immediate vascular exudative reaction follows upon exposure of the sensitized tissue to the specific excitant.

4 *Eosinophilia.* It is present in a large percentage of subjects.

5 *The positive skin test* An urticarial reaction follows when subjects are tested with a class of allergens to which they are sensitive The sensitiveness is usually multiple i.e. these individuals react not to one only but to many allergens

6 *Transfer of the shock organ* Transfer of the shock organ from the corium of the skin to other organs frequently occurs as the child grows older *Transfer disturbances may include* asthma, hay fever recurrent upper respiratory disorders and pollinosis.

The shock organ in contact dermatitis is located in the superficial layers of the skin hence *patch testing and not intradermal testing is indicated.* On the other hand in atopic dermatitis, the shock organ is located in the blood vessels of the corium hence scratch tests and intracutaneous skin tests are called for in contrast *to patch testing*

Etiology—Our notions regarding the etiology are changing constantly At one time the proteins of the infant's food were indicted later fat was blamed then carbohydrates still later a disturbance in the mineral metabolism was presumed to be the cause.

Atopic dermatitis is perhaps as common in other countries as in the United States. In the Scandinavian countries it constitutes the most common and important skin affection in infants and children. Females are affected equally with males.

In Rowe's series of 100 cases the onset occurred within the first two years of life in 90 per cent of cases. The disease was perennial in 67 per cent with definite exacerbations during the spring and summer in 28 per cent. Food allergy was the sole cause of atopic dermatitis in 44 per cent. Inhalant allergy alone was responsible for atopic dermatitis in 50 per cent of cases and in association with food allergy in 41 per cent.

It is generally recognized that other members of the family of a person with atopic dermatitis may be similarly affected, either with the same dermatosis or with closely related disturbances.

Sensitization or an allergy to *foods is not uncommon* during the first year of life the most common offenders are cow's milk wheat and egg (albumin) Ratner and Untracht attribute

the frequency of egg reactions in early infancy to intrauterine sensitization.

INHALANTS.—The inhalants responsible include wool, silk, feathers, kapok, rayons, dust, human and animal dander and other substances. Investigators such as Tuft, Epstein, and Rowe have reported that inhalant antigens play a role in the etiology both in adults and children. Improvement of the dermatitis was observed when therapy with extracts from antigens involved in the respiratory allergy was started. Osborne and Walker reported examples of atopic dermatitis induced both by local contact and the inhalation of wool. More recently Osborne and Murray have stated that dermatitis develops in twice as many infants a month during the cold as in the warm months. They therefore concluded that this increased incidence is due primarily to exposure to wool, both by contact and inhalation. Further they found that 75 per cent were much improved or entirely free of dermatitis during the summer months. Of 89 patients with chronic atopic dermatitis followed for 5 to 26 years, for 59 of the entire group, or approximately two thirds, wool was shown to be the dominant allergenic factor. Hill also reported cases of atopic dermatitis due to local contact with wool and to the inhalation of wool fiber.

SEASONAL VARIATIONS.—In atopic dermatitis, the vascular system (or the superficial capillaries of the corium) is labile and, accordingly, may be influenced by many factors acting extrinsically or intrinsically. Precipitating factors, when brought into contact with the sensitizing organ, the corium, may initiate cycle of histopathologic events which is recognized clinically as an acute flare-up of the skin. *Pollens* such as ragweed and others, may serve as precipitating factors. In the case of pollens it is the oily fraction which comes into contact with the skin and is perhaps absorbed transepidermally. The water-soluble fraction of airborne pollens may be absorbed by inhalation.

BACTERIA AND FUNGI.—1. Bacteria (Staphylococcus pyogenes).* —From time to time the staphylococcus and other pyogenic microorganisms have been incriminated in the etiology. It is commonly believed that bacteria may influence the course of eczema.

2. Fungi.—When Perlman tested 68 eczematous infants and children with five different fungous extracts, including oidiomycin and trichophytin 0.1 cc. intracutaneously in a fashion similar to the tuberculin tests (reactions delayed for 4 hours) there were no positive reactors. Scrapings and cultures were carried out, no pathogens were found. Accordingly this investigator concluded that fungous infections of the skin play little part in the eczematoid dermatoses.

PSYCHOGENIC CONCEPT.—While an unbalanced sympathetic nervous system may serve to explain the repeated flare-ups frequently seen in atopic infants and children, and while emotional stress worry anxious anticipation—the last particularly common among students before school examinations—are generally recognized as having something to do with the recurrence of the disease, many dermatologists are inclined to regard them merely as precipitating factors.

The so-called *mother rejection complex* stressed by some psychoneurologists has not been accepted by most dermatologists. This concept assumes that there is a failure on the part of the infant to obtain from his mother or mother substitute adequate soothing physical contact such as caressing and cuddling. Accordingly instead of being left alone "to cry it out," infants should be picked up and physical contact should be mainly by cuddling and general patting. The lack of cuddling and caressing in most cases studied was thought to be an important factor in causing eczema. Studies along this path of research have been carried out by Spitz and others.

EMOTIONAL STRESS.—Selye believes that the allergic or atopic diathesis should be included in the disease of adaptation, since these disorders may very well depend largely on a derangement of the pituitary-adrenocortical response to stress.

NEUROVASCULAR INSTABILITY.—A working hypothesis by Williams is based on the autonomic vascular reaction. Williams found that the typical histologic picture of allergy may oc

*The criteria of pathogenicity are the production of coagulase and the fermentation of mannite. A staphylococcus without these properties is referred to as the staphylococcus albus.



Fig. 12.—*Atopic dermatitis, exudative phase.* Note erythema, dried exudate and crusts. (Courtesy of Dr C. S. Wright and Dr J P Guequierre.)

cur without the intervention of an antigen-antibody mechanism Sympathetic or parasympathetic imbalance results in a dilatation of the capillaries which leads to extravasation of serum and electrolytes and eventually edema. The factors which may bring this imbalance into play are many for example protein substances, emotional stress and physical factors, alone or in combination This theory has been endorsed by O Leary

FATIGUE.—Fatigue as a characteristic feature of the atopic individual has been stressed by O'Leary and by Becker and Obermayer and others O'Leary states that the atopic tires more easily and needs more rest in bed than the non atopic.

DEFECTIVE PHYSIOLOGIC FUNCTIONING OF THE ECCRINE APPARATUS.—It is a well-known fact that atopic individuals do not do well during hot, humid weather Studies have shown that *the cause is a plugging of the sweat ducts over a* wide area of the skin It is possible that the beneficial effect of the hormones cortisone and corticotropin *lies in the fact that they act as extremely strong stimulants to sweating.*

INTERCURRENT INFECTIONS.—Microorganisms and viruses causing infections such as grippe or tonsillitis may cause the atopic skin to flare up Such patients are unusually susceptible to virus infections. In pediatric practice, Kaposi s varicelliform eruption (due to the herpes virus to which the atopic infant or child has been exposed) and eczema vaccinatum are occasionally seen. The latter condition may be brought about in an atopic infant or child by vaccination.

Clinical Picture —The clinical picture of eczema is well known to all pediatricians. After the initial stage of erythema there follow as stages in the dermatosis, edema vesiculation, exudation and crusting (Fig. 12) In favorable cases healing of the lesions is preceded by scale formation. However various stages of the eczematous condition are often present together intermingled Moreover relapses are frequently seen even when improvement has progressed to the healing stage and then late edema and oozing may still occur Nevertheless, in spite of

these irregularities, the diagrammatic representation of the progressive stages of eczema (Fig. 13) does have its use.

Atopic dermatitis is a polymorphic dermatosis which presents in an irregular manner varying combinations of erythema, papules, vesicles, pustules, crusts, scales, superficial excoriation and fissures. The signs follow in a waxing and waning manner now better now worse. Pruritus is a characteristic feature and, while this symptom may be mild or severe, it is paroxysmal, causing restlessness, sleeplessness and sometimes refusal of food. It is always present, however and this symptom and edema are two seems tough and leathery to the sense of touch and is always infiltrated (Fig. 16)

Atopic children in general are precocious and are always on the go. They are seldom quiet, but are active and even aggressive in expending their energies. Such children can easily be picked out among others in any pediatric office practice when seen for the first time, even before the diagnosis has been reached. In many instances these children are destructive, incapable of sitting quietly for any period of time, jumping around from "pillar to post.

Vascular instability may be demonstrated in an atopic patient by stroking the skin with a

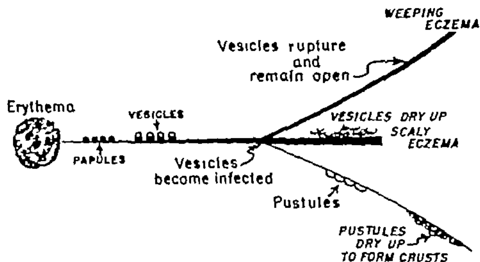


Fig. 13.—Schematic representation of the stages of eczema. (After MacKenna, R.M.B. Diseases of the Skin 4th ed London Bailliere, Tindall and Cox, 1937))

of the cardinal features. Indeed, itching is frequently the forerunner of an acute flare-up I the acute stages, the denuded skin may resemble an acute burn I early infancy (under one year) the lesions tend to be more or less generalized over the entir skin surface I older infants (tw years and over) the lesions tend to become mor or less localized (Fig 14) upon such areas as the face and neck nd the antecubital and popliteal regions Lichenification, by which is meant an increase in the linear markings of the skin, denotes chronicity (Fig. 15) This feature is seen in long-standing cases in which the diseased skin comes to resemble patch of leather Lichenification is, of course, seldom seen in young infants. A lichenified plaque blunt instrument. A red line appears, followed by a blanched line persisting for five minutes or longer (In the non-atopic patient, such stroking will produce a red line, a flare then a wheal.) According to Lobitz, this phenomenon is caused by acetylcholine which produces a delayed response in the blanching reaction supposedly due to the direct action of the vasoconstrictor substances on the blood vessels of the skin. In children of school age the clinical manifestations may be aggravated by intensive work or study for instance, in preparing for school examinations.

Diagnosis.—The diagnosis of atopic dermatitis in infants and children depends not only on the clinical features of the disease but upon cer

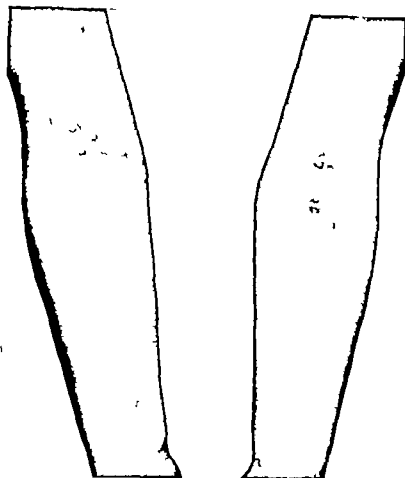


Fig. 14.—Subacute phase of atopic dermatitis in a girl 3 years of age. Acute erythema is still subsiding although a few vesicles are still to be seen on flexural surfaces of elbows, arms and forearms. Neck and face also were affected.



Fig. 15.—Chronic atopic dermatitis in a girl 10 years of age. Note typical areas of lichenification characteristic of chronicity located on popliteal areas and posterior aspects of thighs and legs. This patient had an associated asthma and showed many positive skin tests. (Courtesy of the late Dr Bret Ratner The Flower and Fifth Avenue Hospitals, New York.)

tain additional data which may be obtained from a careful history The over-all picture favoring the diagnosis of atopic dermatitis may be summed up as follows (1) Evidence of allergic diseases such as asthma, hay fever atopic dermatitis, allergic migraine, gastrointestinal allergies, and allergic sinusitis exists in closely related members of the family The expression "familial tendency (an atopic background) is a common observation for such individuals. Frequently however there is no family history of allergy ( ) A tendency to multiple sensitization is demonstrated on exposure to inhalants and ingestion of certain foods. (3) Eosinophilia is found in a large percentage of such patients. (4) Skin testing is sometimes of diagnostic value in infants under two years of age. A positive reaction consists of an immediate or urticarial wheal occurring in response to testing with allergens by the scratch or intradermal method. (5) A positive reaction from the Prausnitz Küstner test, which is also spoken of as a passive transfer test, indicates the presence of P K antibodies.

SKIN TESTING IN INFANTS.—While most allergists are definitely in favor of skin testing in infants, many dermatologists are opposed to it because it is not always significant. Furthermore, when skin tests to foods give positive results and the specific foods are then eliminated from the diet, still improvement fails to follow in a large number of children. On the other hand, a food responsible for atopic dermatitis may frequently be picked up by scratch or intracutaneous testing. Accordingly skin testing may at times be of practical importance in solving seemingly hopeless therapeutic problem. Nevertheless most dermatologists are of the opinion that skin testing is a waste of time, money and effort during the first two years of life

Clinical Evidence.—As has already been mentioned, infants tend to show a more or less generalized eruption with erythema and vesiculation. The infant skin has a greater tendency than the older child's and adult s to vesiculate because the epidermal border is more permeable and the stratum corneum is poorly developed Other lesions noted at this time may include papules, crusts and excoriations. Edema, characterized by the exudation of serum from the ruptured vesicles, is referred to as "weeping or oozing by the laity Secondary infection, not uncommonly present, is recognized as a pyoderma. After infancy there is a tendency for lesions to become localized on certain areas, such as the forehead, cheeks and neck, and the antecubital and popliteal areas. Lichenification and hyperpigmentation in those areas speak strongly in favor of the diagnosis of atopic dermatitis. The cyclic course, with the disease now better and again worse, together with polymorphic lesions and paroxysmal itching, is a characteristic diagnostic picture.



Fig. 16.—Lichenified plaque of neurodermatitis of tw years duration in a boy 10 years of age. Atopic dermatitis had started at 3 months of age. Several satellite lesions can be seen above the larger lesion.

Differential Diagnosis.—Atopic dermatitis should be differentiated from dermatitis venenata, seborrheic dermatitis, cutaneous candidi-

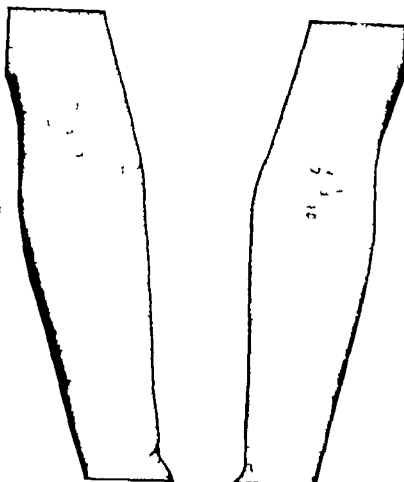


Fig 14 —Subacute phase of atopic dermatitis in a girl 3 years of age Acute erythema is still subsiding although a few vesicles are still to be seen on flexural surfaces of elbows, arms and forearms. Neck and face also were affected.



Fig. 15 —Chronic atopic dermatitis in a girl 10 years of age Note typical areas of lichenification characteristic of chronicity located on popliteal areas and posterior aspects of thighs and legs. This patient had an associated asthma and showed many positive skin test (Courtesy of the late Dr Bret Ratner The Flower and Fifth Avenue Hospitals, New York)

eralized adenopathy in atopic dermatitis. Atopic dermatitis is characterized by cycles of improvement and recurrence: the edema is more profound.

In *miliaria* the lesions are discrete, each minute lesion is surrounded by an erythematous zone. A history of excessive sweating may be elicited and the itching is minimal, if present at all. Miliaria is a self-limited disease. The condition responds to prophylactic and antiphlogistic topical remedies (starch baths, evaporating lotions, etc.)

In *urticaria* the lesions are discrete. Raised, edematous and evanescent wheals are present, but these are never grouped. The presence of such lesions is sufficient evidence to differentiate urticaria from atopic dermatitis.

Lupus erythematosus (squamous type, on the face) is exceedingly rare among infants. The lesions are dry and scaly: in atopic dermatitis, they are moist. The symmetrically distributed plaques are demarcated in lupus erythematosus; later follicular plugging and atrophy of the skin follow. The plaque in atopic dermatitis gradually disappears into the normal surrounding skin, and it is never characterized by follicular plugging and atrophy. Itching, a characteristic symptom in atopic dermatitis, is absent in lupus erythematosus.

In *pityriasis rubra pilaris* the lesions are dry: in atopic dermatitis they are characterized by edema at some time in the course of the disease. Follicular papules on the dorsal surfaces of the fingers and hyperkeratosis of the palms and soles are characteristic features in the later stage of pityriasis rubra pilaris. Pruritus is mild or absent in pityriasis rubra pilaris, it is always present in atopic dermatitis.

Psoriasis occurs as a generalized eruption or localized dermatosis with well-defined plaques. It is rarely seen in children under five. The scales in psoriasis are nearly always dry, lustrous, and when removed, present bleeding puncta. The lesions in psoriasis are never moist unless they ha become eczematized, but in atopic dermatitis edema is a characteristic feature. The plaques in topic dermatitis gradually disappear into the normal surrounding skin whereas in psoriasis the lesions are sharply outlined. There is considerably less scaling in atopic dermatitis than in psoriasis. Itching, when present in psoriasis, is never as intense as in atopic dermatitis.

In *congenital syphilis* the lesions are usually localized on the face, palms and soles. They are circumscribed and deeply infiltrated, itching is absent. The eruption in atopic dermatitis is usually generalized in infants; itching is an important symptom. Too, a history of infection, positive results from serologic blood tests and other signs and symptoms of congenital syphilis will tend to differentiate it from atopic dermatitis.

Trichophytosis corporis (tinea circinata) is uncommon in infants. The lesions are circinate, few in number erythematous and scaly or marked by a raised vesicular border. The lesions tend to clear in the center. The lesions in atopic dermatitis are polymorphous and characterized by edema at some time in the course of the disease. Itching may be mild in tinea circinata it is moderate or severe in atopic dermatitis. A history of contagion may be elicited in tinea circinata and microscopic examination of the scrapings from the lesions and culture will reveal the causative factor.

Tinea capitis is characterized by circumscribed areas of baldness, with broken-off lusterless hair stumps. In contrast, atopic dermatitis in the scalp is characterized by crusts resulting from edema. Itching is slight or absent in tinea capitis; it is severe in atopic dermatitis involving the scalp. If doubt exists, microscopic examination and culture of the infected hair will disclose mycelia and a growth of fungus.

In *pityriasis rosea* a herald spot usually precedes the generalized eruption by a week or ten days. When the eruption is full-blown, the oval-shaped patches follow the lines of cleavage of the ribs in the shape of an inverted Christmas tree. The lesions are waferlike, superficial, of a salmon color and do not show infiltration of the skin such as occurs in atopic dermatitis. Finally the scales break in the center remaining attached at the periphery. Pityriasis rosea runs a self-limited course. Atopic dermatitis is a capricious disorder but edema is present at some time during the course of the disease: edema is absent in pityriasis rosea.

I *impetigo contagiosa* the diagnosis is comparatively simple. In contrast to atopic derma

asis, scabies erysipelas, erythema intertrigo erythema multiforme prurigo of Hebra miliaria, urticaria lupus erythematosus pityriasis rubra pilaris, psoriasis congenital syphilis, trichophytosis corporis, tinea capitis pityriasis rosea and impetigo contagiosa.

In *dermatitis venenata* (contact dermatitis) a careful *history will usually* reveal that a local irritant is responsible The absence of allergies in other members of the *family the acute onset* and the subsidence of the signs following withdrawal of the local irritant are other points in favor of a diagnosis of contact dermatitis

Dermatitis venenata due to poison ivy sumac and poison oak is characterized by a severe inflammatory reaction of the exposed areas of the skin. The acute erythema and severe edema is part of the clinical picture Here too *vesicles frequently appear in a linear formation* A direct history of exposure to such plants may often be ascertained

In *seborrheic dermatitis* the individual seborrheic plaques on the glabrous skin are demarcated and stand out prominently not unlike dry potato chips while the atopic dermatitic plaques merge gradually into the normal skin.

In *cutaneous candidiasis* (moniliasis) the localized type occurs usually around the diaper area, although umbilicus, axilla and groins may also be involved *Often there is associated* thrush of the mucous membrane of the mouth *and tongue and* the nails may be affected (onychia paronychia) The individual lesions are demarcated they do not merge into the normal skin as do the plaques of atopic dermatitis. Satellite lesions are frequently seen Final diagnosis rests on obtaining a positive yeast like growth on cornmeal agar Culture of the stool often yields a growth *which is pathogenic*.

In *scabies* when the lesions become eczematized through scratching or through the use of topical medication they may be confused with atopic dermatitis. In scabies, however the lesions are more discrete and they are less apt to form patches (plaques) The areas of predilection in scabies are the webs of the fingers, anterior aspects of the wrists anterior axillary folds, abdomen *especially around the umbilicus*, lower half of the buttocks, intergluteal folds, elbows external genitalia and between the toes. In young infants lesions may be seen on the face and on palms and soles. Because scabies is a contagious disease other members of the family soon become affected, in contrast to atopic dermatitis. Of course, discovery of the cunniculus and the acarus settles the diagnosis for scabies. Itching in scabies is nocturnal In atopic dermatitis it is paroxysmal and may occur either day or night

In *erysipelas* the erythema and the edema are much more intense than in atopic dermatitis. The inflamed surface of the skin has a sheen *not seen in atopic dermatitis. The lesion in* erysipelas is definitely demarcated, while the eczematous plaque merges gradually into the normal surrounding skin Constitutional symptoms are present in erysipelas they are absent in atopic dermatitis.

Erythema intertrigo occurs in the intertriginous folds particularly in obese infants. The inflammatory reaction of the skin is much milder than in atopic dermatitis. The skin is not infiltrated and improves readily when proper hygienic measures and simple dusting powders are prescribed Atopic dermatitis is a capricious disease.

In *erythema multiforme* the edema does not appear as weeping as is seen in atopic dermatitis, but appears as localized bullae on the extremities. Constitutional symptoms, in the form of prodromal symptoms such as headache nausea, vomiting malaise and fever commonly occur in erythema multiforme but are absent in atopic dermatitis Furthermore, the *vesiculobullous lesions that are not uncom*monly found on the mucous membranes in *erythema multiforme* are not found on these sites in atopic dermatitis. Erythema multiforme frequently recurs seasonally atopic dermatitis may occur anytime during the year but is often worse during hot, humid weather Itching, when present in erythema multiforme is mild or even entirely absent in atopic dermatitis it usually is severe

Prurigo of Hebra is a condition seldom seen *in the United States. It occurs shortly* after birth and then is chronic and persistent throughout life It is characterized by the appearance of minute and larger papules and by intense itching A generalized adenopathy (especially inguinal adenopathy) occurs later there is no gen-

single measure or device but upon the joint ef fort of both specialties.

Prophylaxis.—Prophylaxis consists in efforts to eliminate allergenic foods from the diet, and to avoid the inhalation of pollens, dust and other airborne allergens as well as woolens, rayons, silks, or other contactants to which the infant or child is definitely hypersensitive.

Environmental Control.—Striking improvement sometimes occurs when the patient is transferred from his home to some other environment. When the season and the financial circumstances of the parents permit, a complete change in the place of living is in order. An extended stay at the seashore with indulgence in ocean bathing and basking in the sun will frequently produce remarkable improvement.

A question frequently raised by pediatricians in severe cases of atopic dermatitis with extensive involvement is that of hospitalization. A change from the home may in itself be helpful. Furthermore, it can relieve the mother from the strain of caring for her infant. However it has been shown that the atopic infant is not only more susceptible to infection than others, but that cross-infections in most infant wards are common. Schwartzman's report is noteworthy on this topic. He found that upper respiratory infections were acquired nearly twice as frequently by eczematous infants as by normal infants. Other studies carried out by Schwartz and by Koch and Schwartz earlier anticipated Schwartzman's report. These investigated the problem as it occurred in 103 patients with infantile eczema admitted to the Milwaukee Children's Hospital between August, 1922, and April, 1931. For these children the mortality rate was 17.9 per cent which, as the investigators pointed out, is higher than the mortality rate reported by Cutler for acute appendicitis (11.4 per cent), for empyema (16.4 per cent), for pyloric stenosis (11.1 per cent), and for fracture of the skull (10 per cent). Koch and Schwartz observed also that respiratory infections and diarrhea were the most common complications. Glaser and Edwards found a mortality of 3.8 per cent, which later their findings increased to 20 per cent. Accordingly hospitalization is not recommended for infant with atopic dermatitis except as an emergency measure.

REMOVAL OF OFFENDING ALLERGENS.—The removal of the affecting allergens is the ideal therapy but the difficulty is to determine to what particular one the patient is sensitive. (The disadvantage of skin testing has already been mentioned under Diagnosis.) A careful trial of suspected foods may often reveal the offender. The author has found such trials more rewarding than the inconsistent results of scratch tests.

Why does an infant refuse certain foods which it has learned disagree with him time and again? For want of a better term we may call it instinct, but whether we call it one thing or another makes little difference. The impressive fact remains that for some reason the patient seemingly knows those foods that are poorly tolerated and disagree with him. Such determinations are everyday experiences with pediatricians and to regard them as insignificant and due to mere whim is certainly a mistake. It may be granted that after one year of age, foods come to play a less significant role; accordingly their importance after that date as a cause of atopic dermatitis seems to have been greatly overestimated. Regarding food allergens, Sulzberger states "The approach through the history, the close observation of the effects of elimination and re-exposure to certain foods and the constant awareness that a certain few foods are notorious offenders will prove to be more successful as a rule than reliance on the results of hundreds of cutaneous tests. For although results of cutaneous tests are, in infantile eczema, often without clinical significance even accompanied by specific reagins conversely substances that fail to elicit cutaneous reactions may nevertheless sometimes be factors in the production of the eruption.

No less an authority than O'Leary states that he does not believe that atopic dermatitis in infancy is ever cured by dietetic adjustment, although dietetic changes may be advisable as in other diseases of children. Nor does he believe that food per se produces the syndrome of atopy although he believes it may aggravate the atopic state.

When food proteins, such as cow's milk, eggs and wheat, have been found definitely to be responsible, then, of course, these should be eliminated and replaced in the diet with equally im

titis, the discrete thin walled vesicles containing pus are usually but not invariably seen on the exposed surfaces of the skin The vesicles rupture is followed by the discharge of serum (or pus) which is then followed by a superficial "stuck-on wafer like crust. The lesions are never infiltrated It is a self-limited disease and responds to the proper topical applications with antibiotics and antibacterial remedies

Complications.—*Bacterial infection* is the commonest complication Most frequently responsible are the Beta hemolytic streptococci and coagulase positive staphylococci Acute glomerulonephritis occasionally occurs as a sequel of streptococcal infections of the skin

Iatrogenic disease may be produced by the physician in his effort to treat the patient. Malnutrition, hypoproteinemia, macrocytic anemia together or separately may be produced by overzealous dietary restrictions or prescriptions. Boron poisoning may follow the use of boric acid compresses, ointment or powder on denuded surfaces. Nephrosis can be produced by the application of coal tar products to large denuded areas of the skin. Thrombo-embolic phenomena with gangrene may occur after prolonged treatment with cortisone and corticotropin.

Atopic erythroderma (Hill) is an exfoliative form of atopic dermatitis associated with mal nutrition generalized lymphadenopathy and hy poproteinemia. It is discussed elsewhere in this Chapter

Lens changes in the eye with premature cat aract are uncommonly seen. The ectodermal origin of both skin and lens is thought to be responsible for the involvement of the lens in the general sensitization process. Brunsting has reported 10 cases of atopic dermatitis with associated juvenile cataracts, in patients who at no time received roentgen therapy He suggested that cataracts in atopic dermatitis may be caused by the irritation of the optic lens by circulating allergens.

Blockage of sweat ducts with sweat retention is present in the affected areas. In a hot environment, this contributes to prolongation of itching inflammatory changes and the chronicity of the dermatitis.

Virus infections are caused by the herpes simplex (eczema herpeticum) and vaccinia (ec zema vaccinatum) viruses. The infections usually occur in those who have never had contact with the virus before and who, therefore, have no neutralizing antibodies. Children with atopic eczema should not be vaccinated nor should they be allowed to come in contact with those who have been vaccinated or who have vesicular lesions of herpes simplex.

Sudden collapse and death may take place in the course of infantile eczema This complication occurs particularly among infants who have been hospitalized. Many causes for sudden death have been advanced among them status thymolymphaticus an overwhelming infection, acute anaphylactic shock acute psychologic re action due to separation of the infant from its mother and severe electrolyte disturbance (vomiting or diarrhea) The most dangerous time is the first seven to fourteen days in the hospital. Death frequently occurs when the skin condition itself is improving

Prognosis.—Atopic dermatitis is character ized by remissions and recurrences. The dermatosis usually appears during the first year of life, with most cases occurring between 2 and 4 months of age. The clinical manifestations may continue for one to two years and in a small group of patients, be followed by spontaneous and permanent disappearance of the lesions. In the majority of cases, however the dermatitis recurs at the age of 5 or 6 years. Signs and symptoms may again disappear until the age of 10 or 12 years, when the disease again may manifest itself

Treatment.—In general there are two approaches, the pediatric and the dermatologic, to the treatment of the atopic eczematous infant or child. Both aim at the same object namely the restoration of a sick skin to a state of health. The pediatric approach tends to emphasize dietetic factors of causation The dermatologic approach is chiefly concerned with topical remedies. Each method has its place, but the best care for the infant suffering from atopic dermatitis calls for the application of both in combination, with pediatrician and dermatologist both making contributions from their respec tive specialties. Improvement and ultimate cure depend, in the end, not upon the utility of any

single measure or device but upon the joint ef fort of both specialties.

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A question frequently raised by pediatricians in severe cases of atopic dermatitis with extensive involvement is that of hospitalization. A change from the home may in itself be helpful. Furthermore, it can relieve the mother from the strain of caring for her infant. However it has been shown that the atopic infant is not only more susceptible to infection than others, but that cross-infections in most infant wards are common. Schwartzman's report is noteworthy on this topic. He found that upper respiratory infections were acquired nearly twice as frequently by eczematous infants as by normal infants. Other studies carried out by Schwartz and by Koch and Schwartz earlier *anticipated* Schwartzman report. These investigated the problem as it occurred in 103 patients with infantile eczema admitted to the Milwaukee Children Hospital between August, 1922, and April, 1931. For these children the mortality rate was 17.9 per cent which, as the investigators pointed out, is higher than the mortality rate reported by Cutler for acute appendicitis (11.4 per cent), for empyema (16.4 per cent), for pyloric stenosis (11.1 per cent), and for fracture of the skull (10.2 per cent). Koch and Schwartz observed also that respiratory infections and diarrhea were the most common complications. Glaser and Edwards found a mortality of 3.8 per cent, which later their findings increased to 70 per cent. Accordingly hospitalization is not recommended for infants with atopic dermatitis except as an emergency measure.

Removal of Offending Allergens.—The removal of the affecting allergens is the ideal therapy but the difficulty is to determine to what particular one the patient is sensitive. (The disadvantage of skin testing has already been mentioned under Diagnosis.) A careful trial of suspected foods may often reveal the offender. The author has found such trials more rewarding than the inconsistent results of scratch tests.

Why does an infant refuse certain foods which it has learned disagree with him time and again. For want of a better term we may call it instinct, but whether we call it one thing or another makes little difference. The impressive fact remains that for some reason the patient seemingly knows those foods that are poorly tolerated and disagree with him. Such determinations are everyday experiences with pediatricians and to regard them as insignificant and due to mere whim is certainly mistake. It may be granted that after one year of age, foods come to play a less significant role; accordingly their importance after that date as a cause of atopic dermatitis seems to have been greatly overestimated. Regarding food allergens, Sulzberger states "The approach through the history the close observation of the effects of elimination and re-exposure to certain foods and the constant awareness that a certain few foods are notorious offenders, will prove to be more successful as a rule than reliance on the results of hundreds of cutaneous tests. For although results of cutaneous tests are, in infantile eczema, often without clinical significance, even accompanied by specific reagins; conversely substances that fail to elicit cutaneous reactions may nevertheless sometimes be factors in the production of the eruption.

No less an authority than O'Leary states *that* he does not believe that atopic dermatitis in infancy is ever cured by dietetic adjustment, although dietetic changes may be advisable as in other diseases of children. Nor does he believe that food per se produces the syndrome of atopy although he believes it may aggravate the atopic state.

When food proteins, such as cow's milk, eggs and wheat, have been found definitely to be re sponsible, then, of course, these *should* be eliminated and replaced in the diet with equally im-

portant but non-allergenic foods Wolpe fed a large series of eczematous infants with various milk substitutes. He concluded that those fed on *milk substitutes reached a clinical relief faster* than those on milk. Bowen and Bloom believe that in milk-sensitive infants, evaporated milk boiled four hours should first be tried. Most pediatricians and allergists believe that when evaporated cow's milk fails to improve the eczema, then goat's milk will rarely be of value as a substitute. Ross and Brown hold that boiled evaporated milk mixtures are the most satisfactory type of feeding for infants with eczema due to milk sensitivity However it may be well to emphasize the desirability for not prescribing substitution products for cow's milk routinely as is often done. Unless cow's milk is found to be the offender it is not necessary to resort to the *use of milk substitutes. Ratner has shown that* because the heat labile elements in milk (lactalbumin and lactoglobulin) are responsible for practically all cases, some form of heat treated or *chemically* denatured milk can safely be used.

Stoesser obtained great relief or cure in a large percentage of cases receiving a soy bean preparation There are a large number of substitutional foods for cow's milk upon the market among them goat's milk (whole) evaporated milk evaporated goat's milk, Mull Soy Sobee, Nutramigen and Hypo-allergic milk and other milks of low curd tension. Because all pe*diatricians are familiar with these preparations* and skilled in handling infants and children upon these foods, their use need not be discussed here Glaser has described a satisfactory milk substitute whose protein is meat. Liquefied meats that may be used for this purpose are *now available commercially* These preparations completely satisfy the requirements for growth and development in infants and children Under no circumstances should the diet of *the growing infant or child be curtailed so as* to endanger its health.

PHYSIOLOGIC AND MENTAL REST (INCLUDING RELIEF OF ITCHING) —Physiologic rest is always important *for the welfare of infants but it* is even more important for the victims of eczema because of their greater loss of energy owing to restlessness constant crying and refusal of nourishment. Because they are irritable and in pain they are poor sleepers* and so they continue as long as their lesions are in an acute stage or past it, even in the chronic lichenified stage All this time they are not only wretched in themselves but a disturbance to their household. Accordingly rest becomes imperative for the sake of all concerned It may be achieved by several means mechanical, by splinting and other devices and medicinal, both topical and internal.

The use of *handcuffs elbow splints and other devices* to prevent scratching seems to be good therapy contrary to the opposing opinion of some dermatologists, pediatricians and mothers. It should be remembered that in atopic eczema the skin is already the seat of a dermatitis i.e., it is acutely inflamed Accordingly in the *writer's opinion nothing could be more absurd* than to permit an eczematous baby to scratch because of itching To let it do so means to let it inflict wounds upon the already damaged skin. *Furthermore, the constant presence upon* the skin of streptococci and staphylococci may result from scratching in a pyoderma often rebellious to therapy Certainly such a complication is to be avoided *Although* certain *highly* limited experiments with chicks, wherein their motions were restricted, resulted in increased pecking and pulling off of feathers and generally increased restlessness, in contrast to the conduct of unrestricted control chicks, still the writer is not convinced that restriction of motion in infants necessarily produces tics. Cutting the nails short does not prevent injury for rubbing the skin with the hand, and so traumatizing it, is equally bad Accordingly he unequivocally endorses the use of splints (Fig. 17)

This author is not convinced that *soap and water* are irritants to a normal skin although he is convinced that they are bad detergents for a sick skin for this reason he agrees with the majority of dermatologists that the use of ordinary soap and water as cleansing agents is contraindicated in atopic dermatitis.

Among topical remedies colloidal baths (Chapter 6) in the form of starch or oatmeal

*The writer has found Aveeno serviceable for this purpose.

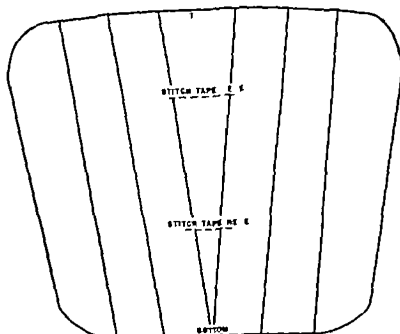


FIG. 17.—How to make splints with tongue depressors and muslin for arms of eczematous infants. Cut two pieces of unbleached muslin for each cuff. Stitch two strips of ½-in. tape 12 in. long to center of one piece. Turn in edges ½ in. Stitch three sides. Stitch along lines to form pockets. Insert wooden blades. Sew up fourth side. Wrap cuff around baby' arm at elbow over shirt and tie tapes. (By permission from Stoesser, A. V. and Nelson, L. S. The Journal-Lancet, 73 No. 12, p. 487 December 1953.)

are valuable because they serve to allay acute erythema and itching. Accordingly the author has made it a rule to instruct mothers in the routine starch bath in all cases of eczema. Although the bath may not achieve everything that one may wish for in a topical remedy, it is still a serviceable adjunct, being soothing to the inflamed skin and at the same time of psychologic benefit to the mother.

Antihistaminic ointments and creams employed for their antipruritic effect have been disappointing in my experience; accordingly I do not employ them for the treatment of atopic dermatitis.

MAINTENANCE OF ADEQUATE NUTRITION AND FLUID REPLENISHMENT.—I am convinced that it is unwise to treat an infant suffering from little eczema, or even a moderately severe one which will certainly disappear with growth, in such a way as to endanger by a strict curtailment of foods, its general health to the point of an impending acidosis and possible loss of weight. Instances of weight loss because of dietetic management are familiar to most dermatologists, but surely no treatment, no matter how effective from the therapeutic point of view, is justified if the general health of the patient is actually endangered.

A fact commonly overlooked in the management of atopic dermatitis when involvement is extensive is that the constant *weeping of the lesions* may result in considerable fluid (serum) loss with consequent decrease in the serum protein and disturbance in the electrolyte balance.

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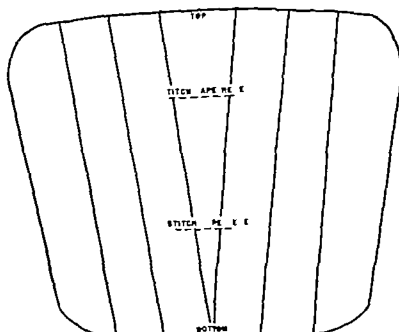


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The first (acute) stage —Microscopic examination of corium and epidermis shows the tissue laden with fluid (Fig 18) This edema which characterizes the process in the "wet stage," is a true "waterlogging" of the cells. Close examination shows that the edema is not only within individual cells (parenchymatous) but is between cells, *in the interstices of* the epidermis (interstitial) It will be *noticed* that edematous *tissue stains badly* (hematoxylin eosin) appearing much lighter than normal tissue *the capillaries are dilated* and their endothelial cells are swollen.

At this stage the most important therapeutic indication is the *ridding of the water logged* tissues of their fluid. This draining away can be accomplished by wet dressings applied *to the le*sions. It makes little difference what the nature of the wet dressing is provided that drainage is properly managed I prefer dressings of either German chamomile (Matricaria N F 9th Ed) of Burow's solution

See Formulary ℞ 3 5

The second (subacute) stage —While there intervenes no clear division histologically between this stage and the first nor between this and the third, certain clinical manifestations warrant its theoretical classification It is well to remember that the pediatrician dealing with eczema is treating an acute-chronic dermatosis which runs a varying course now better now worse. Indeed, most eczemas are *prolonged*, and acute exacerbations are by no means uncommon *Where then does the acute proc*ess end and the subacute process begin? *Clinically one can be reasonably* certain that the acute inflammatory process is over when the *lesions are no longer* wet that is, when oozing has for the most part ceased and the acute erythema has subsided. Histologically it is by no means possible to divide the subacute from the acute process because the edema remains evident even long after the acute process has run its course. However progress can be revealed in the epidermis *by manifestations* less severe than in the first stage.

Itching should be less intense in the second stage although still persistent. Rational treatment will *consist of aid in removing* the remaining inflammation and edema. At this juncture pastes *have a particular usefulness*, prescribed either alone or in combination with one of the *milder tars. It should be remembered* that drainage is still going on through the epidermis al*though not to the extent that it occurred during* the first stage. Accordingly the therapeutist must be *alert not to thwart nature in her* act of ridding the epidermis of the residual fluid by the *application of ointments*. Pastes too when applied, should be spread thinly upon the gauze or

TABLE 13—Clinical Signs and Therapeutic Indications in the Management of Atopic Dermatitis

	First (Acute) Stage (Stage of Edema)	Second (Subacute) Stage	Third (Chronic) Stage
Signs	Erythema, vesicles, oozing (weeping)	Signs less marked	Infiltration skin, leathery type (lichenification)
Indications	Removal of fluid. Relief of itching	Removal of residual fluid relief of itching if still present	Relieve itching. Prevent secondary infection. Prevent recurrence. Restore skin to normal
Classes of therapeutic remedies indicated	Continuous wet dressings	Pastes	Reducing agents
Therapeutic remedies	Matricaria (German chamomile flowers) aluminum acetate solution, silver nitrate solution, potassium permanganate soaks (if impetiginized)	Lassar's plain Zinc Paste U.S.P (Antipruritics may be added if necessary)	The tars (wood, coal, shale) salicylic acid



Fig. 18.—Acute atopic dermatitis. Histopathologic section of the skin during acute exudative stage of atopic dermatitis, when topical management requires wet dressings.

muslin so that it may still absorb the edematous fluid that seeps through the skin. For that reason some dermatologists prefer shake lotions to pastes at this point. There is no contraindication to the use of antipruritics if such are called for or to the use of a mild antiseptic and germicide, which may be added to the paste or the shake lotion.

See Formulary ℞ 64 65

The third (chronic) stage.—The chronic stage of atopic dermatitis is that in which the lesions consist of indurated, lichenified plaques seen particularly over the antecubital and popliteal areas. Not infrequently these lesions are superimposed by the secondary infection. Formerly this type was known as squamous eczema. Histologically it is characterized by an acanthosis and interstitial and parenchymatous edema, an increase in the horny layer of the epidermis and, frequently retention of the nuclei in the horny layer (parakeratosis) together with a moderate cellular infiltration which surrounds the vessels of the upper cutis and the superficial capillaries of the papillary bodies (Fig. 19)

During the chronic stage of eczema such measures are indicated as will alter the status of the skin and return it to a normal state. Agents for this purpose are to be regarded as keratolytics and reducing agents, as remedies that operate in a physiomechanical fashion. Some believe that the improvement following the use of these remedies and devices results from the production of hyperemia of the skin which, in turn, summons up an immunologic response. Older dermatologists produced this effect by the use of the popular flaxseed poultice or by the local application of a 12 per cent salicylic acid ointment allowed to remain upon the lesions for a period of five to ten minutes. Today derma-

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At this stage the most important therapeutic which runs a varying course now better now worse. Indeed most eczemas are prolonged, and acute exacerbations are by no means uncommon Where then does the acute process end and the subacute process begin? Clinically one can be reasonably certain that the acute inflammatory process is over when the lesions are no longer wet that is, when oozing has for the most part ceased and the acute erythema has subsided Histologically it is by no means possible to divide the subacute from the acute process because the edema remains evident even long after the acute process has run its course. However progress can be revealed in

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Itching should be less intense in the second stage although still persistent. Rational treatment will consist of aid in removing the remaining inflammation and edema At this juncture pastes have a particular usefulness, prescribed either alone or in combination with one of the milder tars. It should be remembered that drainage is still going on through the epidermis although not to the extent that it occurred during the first stage Accordingly the therapeutist must be alert not to thwart nature in her act of ridding the epidermis of the residual fluid by the application of ointments. Pastes too when applied should be spread thinly upon the gauze or

cream; i.e., in a washable base, which makes it a satisfactory remedy

See Formulary ℞ 30, 32, 33 43 69

TREATMENT OF SECONDARY INFECTION (PYODERMA, IMPETIGO CONTAGIOSA).—When an impetigo contagiosa complicates the clinical picture of atopic dermatitis, the secondary infection must first be cleared before the management of the atopic condition is resumed, for pathogenic microorganisms (staphylococci and streptococci) may keep the dermatitis active by sensitizing the skin. The management of impetigo contagiosa under these circumstances is similar to that discussed in Chapter 15 Briefly it consists in first getting rid of the crusts by means of soap and water and then applying an antibiotic remedy or bactericidal agent. Penicillin administered topically and sulfa drugs (sulfathiazole and sulfadiazine) in ointment form are contraindicated because their local use may be attended by a high degree of sensitization.

The remedies of choice are

Penicillin G procaine (aqueous suspension) 300,000 units to be given intramuscularly once daily and repeated daily until three or four injections have been given (Penicillin in doses of 100 000 units per os tablets, one tablet t.i.d.)

Bacitracin ointment, containing 500,000 units per Gm. and preferably prescribed in a water miscible base. This antibiotic is an active remedy against gram positive microorganisms.

Erythromycin (Ilotycin) 100 mg. (from 1 to 3 tablets) should be ordered daily according to the age of the patient. For topical use, erythromycin ointment, 1 per cent, may be prescribed.

Silver Nitrate, 0.1–1.0 per cent, in distilled water, painted on the lesions, once daily

Castellani's carbol-fuchsin paint, full strength used as paint on the lesions once daily

Acriflavine aqueous solution, 0 01 per cent, used as paint on the lesions once daily

Methyl rosaniline violet (gentian violet) 1.0–3 0 per cent aqueous solution, used as a paint on the lesions once daily

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An ester-type of flavoring agent with small amount of vanilla added, liquid oral penicillin, well liked by infants and children is Dramcillin. This preparation contains 500,000 units of penicillin G per teaspoonful. Dramcillin-250 contains 250,000 units penicillin G per teaspoonful The dose of Dramcillin-500 is 1 teaspoonful t.i.d. for infants and 1 2 teaspoonfuls t.i.d. for older children. The dose of Dramcillin-250 is 1 teaspoonful t.i.d. for infants and 2 teaspoonfuls t.i.d. for older children.

SEDATIVES.—Sedatives are certainly indicated at any stage in the management of atopic dermatitis. None are better than the barbiturates prescribed orally Occasionally some infants and children may react adversely to the barbiturates although ordinarily most infants tolerate them well. It is my custom to prescribe sodium phenobarbital (soluble phenobarbital) in doses sufficient to produce a sedative effect. I seldom prescribe less than 0.016 Gm. (¼ gr) for very young infants and frequently as much as 0.03 Gm. (½ gr) for older infants, to be given every three or four hours to produce rest. The dose may be repeated at four-hour intervals day and night. On the other hand, the opiates should never be employed because they increase the pruritus and they are habit forming. Occasionally one of the newer antihistamines (e.g., Benadryl or Pyribenzamine) has been helpful but not to the degree of their helpfulness in the treatment of the acute urticarias.

Chloral hydrate is one of the best sedatives for infants and children, being well tolerated and devoid of sensitization effects. Infants under 1 year of age may be given 0 065 Gm. (1 gr) every three or four hours; infants between the ages of 1 and 2 years, 0 13 to 0 19 Gm. (2 to 3 gr) every three or four hours infants between the ages of 2 and 3 years 0.32 Gm (5 gr) every 3 or 4 hours and children over 5 years, 0.6 Gm. (10 gr) every three or four hours. It may be ordered in the form of a liquid with the following prescription

℞

Chloral hydrate	7.0
Syrup of raspberry or syrup of cherry q.s. ad	100 0

Misce et fiat syrupus

Signa One teaspoonful in fruit juice or water every three hours

Indication: Sedative (age 2 years)

Chloral hydrate may also be given by rectum in doses of from 0.32 to 0.65 Gm. (5 to 10 gr) at a single dose.

Glaser recommends Demerol (meperidine hydrochloride) as a sedative. He advises that an infant 2 months of age should receive one-fourth of a 50 mg. tablet every four hours—a dosage that may be gradually increased if necessary



Fig 19.—Chronic atopic dermatitis. Histopathologic section showing dilated blood vessels, acanthosis and edema (revealed by light staining quality)

tologists prescribe ointments and lotions containing a tar Also generalized exposures with suberythema doses of ultraviolet light from a mercury vapor quartz lamp as an adjunct to local therapy are advantageous and are prescribed routinely in all infants and children

Antipruritics may be added to water in-oil emulsions and when called for should be ordered in mild concentrations. Any of the following antipruritics either alone or in combination may be added to such preparations. Phenol 0 05–1 0 per cent, menthol 0 1–0.25 per cent ichthammol 1 0–5 0 per cent solution of coal tar 1 0–5 0 per cent.

Of the tars, this author prefers the following all of which he has used with gratifying results Ichthammol 1 0–6.0 per cent in zinc oxide ointment or in Lassar's paste crude coal tar 1 0–6 0 per cent in Lassar's paste pine tar in the form of the official pine tar ointment in 25 per cent strength for smaller infants and 50 per cent strength for older infants and children in a zinc oxide ointment base solution of coal tar 1 0–5 0 per cent in a simple shake lotion

Crude coal tar is employed in 1 per cent strength in the familiar zinc oxide-starch-petrolatum base and gradually the strength is increased to 6 per cent It is applied uninterruptedly night and day If the lesions are upon the face a mask may be useful in keeping the ointment in place. Crude coal tar may also be used as a paint in full strength.

It is best to renew the ointments constantly removing the old ointment before each new application by means of a bland non-irritating oil like sweet almond oil. The pine tar ointment mentioned above is particularly useful in young infants with atopic dermatitis

℞
Crude Coal Tar (1 5%)	1.2-6 0
Zinc Oxide Ointment q s. ad	120.0
Misce et fiat unguentum	
Signa. Constant application	

Vioform another remedy which deserves mention is chemically a 5 chloro-7 iodo-8 hydroxy-quinoline. It has not enjoyed the popularity it merits although it is official in the U.S P 15th edition Its results in the treatment of infantile eczema as well as in eczemas of older children have been found good by this writer and others In fact on occasions it has proved to be the topical answer to eczema when orthodox treatment with the tars has failed It may be used in strength of 1 to 3 per cent in ointment form, either with zinc oxide paste, zinc oxide ointment or with ordinary petrolatum It is also put upon the market as a 3 per cent

Opinion is divided as to the topical usefulness of cortisone and hydrocortisone ointments, creams and lotions in atopic dermatitis. Glaser was unable to show that cortisone ointment helped any more than a control ointment in 20 cases of atopic dermatitis. On the other hand, Witten *et al.* treated 30 cases of infantile eczema by the simultaneous paired comparison method with 2½ per cent hydrocortisone free alcohol ointment on one side and the vehicle alone on the other. Favorable response was noted in 18 of the patients. These investigators state their opinion that in the general run of cases, the hydrocortisone ointment as used in these studies constitutes the simplest, cleanest and most rapidly effective of all topical measures they have employed in the treatment of infantile eczema. In a previous communication, Sulzberger, Witten and Smith found that 20 patients out of 30 with atopic dermatitis responded satisfactorily to hydrocortisone acetate ointment. In patients in which the response was favorable improvement occurred within 48 hours to one week after treatment was begun. However the beneficial effects wore off within four or five days after the ointment was discontinued.

Roentgen Therapy.—Roentgen therapy is worth a trial after all common measures have failed to bring about improvement. However the author is among those who have never found it necessary to resort to roentgen therapy for the treatment of atopic dermatitis. The author is in total agreement with the current trend of opinion that, in children, roentgen therapy in the management of atopic dermatitis should not be used.

Immunization.—It is commonly believed that immunization procedures should not be carried out in patients with atopic dermatitis. On the other hand, Glaser believes that children with eczema should be inoculated with diphtheria and tetanus toxoid in the same w y and at the same times as other children, since they are no more likely than the normal to have severe reaction, and the author shares this view. However vaccination with smallpox virus is contraindicated.

See Formulary ℞ 3 5 for acute stage, 64 65 for subacute stage; 30 32, 33 43 69 for chronic stage 30 for lichenification and dry type skin, 101 for short course therapy in recalcitrant type of atopic dermatitis 115 for short course therapy in recalcitrant type of atopic dermatitis at age 5 years.

Atopic Erythroderma (Hill)

This term, coined by Lewis W Hill, is used to describe a condition of the skin in atopic dermatitis which is characterized by a generalized rash, at times with some vesiculation, but more often with acute hyperemia and considerable scaling. Such infants show a generalized adenopathy and have cold feet of a bluish discoloration. Eventually the acute clinical picture merges into the classical chronic atopic dermatitis. Passive transfer tests are usually positive. Before introduction of the antibiotics and the corticosteroids, the condition was accompanied by a high mortality The corticosteroids are valuable as a temporary measure in the management of such patients.

Nummular Eczema

(Orbicular Eczema, Mycotic Eczema)

The term "nummular eczema was first used by Devergie to describe patches of dermatitis consisting of circumscribed, definitely marginated, oval or rounded patches, varying in size from a dime to a silver dollar

The etiology is unknown. It has been classified with infectious eczematoid dermatitis by Lever who states that it is probably caused by a temporary loss of esistance in the skin to the ordinary bacterial flora. Another authority is of the opinion that it has nothing to do with allergy and also that it is uncommon in infants Still another states that it is a neurodermatitis. I myself believe that nummular eczema is a variant of true atopic dermatitis, because I have seen instances in which both types occurred in the same patient.

At first, the lesions are dry They often become edematous, however and later may be come lichenified. As the term "nummularis implies, the sharply rounded, demarcated patches are coin-like in appearance. Each patch consists of innumerable small vesicles. The lesions show a predilection for the dorsal surfaces of the

PSYCHOANALYSIS AND PSYCHOTHERAPY —Although psychoanalysis and psychotherapy have frequently served the dermatologist usefully in adjusting problems in adults generally their use in the atopic dermatitis of children has not been successful except perhaps in older children.

ACTH AND CORTISONE* —The use of adrenocorticotropic hormones and cortisone in atopic dermatitis have been studied by independent investigators, notably by Kance *et al* Glaser *et al* DiGeorge and Nelson Glaser Baldwin and Degara, Hill, Lever and others. From their observations there can be no doubt of the spectacular temporary improvement of the skin lesions in infantile eczema. However as soon as the hormones are discontinued, the eruption returns. In view of the temporary value, the expense entailed and the occasional untoward reaction from the use of ACTH it is doubtful that such treatment can be really justified except as an emergency measure when it is absolutely necessary

When ACTH is used the patient should be kept under close supervision. Glaser *et al* used ACTH therapy in two infants, aged 15 and 20 months respectively in doses of 2.5 mg. every six hours by intramuscular injection. In the younger infant the dose was increased every 24 hours to 5 mg. and then to 8 mg. which was continued for 72 hours. Improvement followed the patient was discharged after 11 days, or a total of 179.5 mg. ACTH Recurrence followed and upon readmission to the hospital ACTH was again given in doses of 10 mg every six hours for one week after which the dose was reduced to 10 mg every eight hours.

DiGeorge and Nelson s patient, aged 7½ months, was given ACTH in 5 mg doses at intervals of six hours. Within 24 hours much of the erythema had subsided, and after 72 hours it had entirely disappeared

Hill points out that the best general principle is to use the smallest possible dosage that will keep the eczema under moderately good control and keep the child comfortable and the mother satisfied. Accordingly he believes it best to start with 75 mg of cortisone per day and, as soon as the eczema is controlled to do a downward titration with reduction to 12.5 mg. each time to determine the daily dose necessary for the patient. Cortisone, he warns, is *not to* be discontinued abruptly· therefore he gives 25 mg. a day for four days, then 25 mg. every other day for a week. In the treatment of 18 infants under three years of age, he gave potassium chloride 0.3 Gm (5 gr) twice a day· antibiotics he did not give routinely unless there was the slightest suspicion of a skin or respiratory tract infection

In a recent report by Sulzberger and Witten on prolonged therapy with cortisone for chronic skin diseases in 35 patients, five of which were 2, 11 13 15 and 18 year old subjects of chronic atopic dermatitis, the initial daily dose of cortisone for the infant was 50 mg. which was reduced to 6 mg. after improvement occurred. The older children received initial doses varying from 125 mg. to 150 mg. daily· these doses were reduced as improvement occurred. The treatment with one exception due to untoward effects (sluggishness, sleepiness, moon facies) was continued from four to six months and longer with excellent improvement. In the case of the infant, hydrocortisone ointment replaced cortisone by mouth after six months.

Robinson and Robinson treated 172 patients with the local application of hydrocortisone acetate. In 144 patients complete relief of symptoms and involution of the lesions was obtained for the duration of the administration of the medicament. In all instances relapses occurred when therapy was discontinued, partial temporary improvement occurred in 6 cases 22 persons were not benefited by the application. No untoward reactions followed.

Baer and Leider state that their indications for the use of ACTH and cortisone in atopic dermatitis are (1) to control exacerbations of a relatively otherwise stationary eruption (2) to permit orthodox forms of therapy to become more effective, and (3) to keep away eruption and itching in intractable cases. They state that while ACTH and cortisone should not as a rule be used in atopic dermatitis over long periods of time there are some otherwise intractable cases in which very small maintenance doses (e.g. cortisone 25 mg daily) are adequate.

* A large number of excellent pharmaceutical preparations are marketed under different trade names. The reader is referred t New and Nonofficial Drugs for a complete list.



Fig. 20.—Nummular eczema in 2-year-old boy Note coin shape of lesion, which is erythematous, exudative and scaly (From Perlman, H. H., and Westfall, F J Pediat. 39 565-574, November 1951)

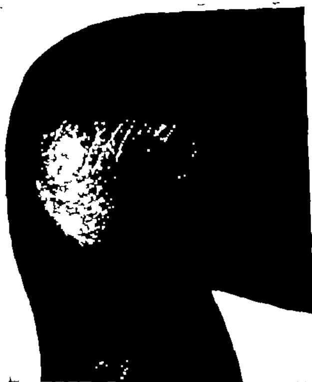


Fig. 21 —Circumscribed neurodermatitis. An excellent example of lichenification in plaque of neurodermatitis on right knee of boy 9 years of age. Note increased linear markings of lesion. (Courtesy of the Dermatology Outpatient Department, The Flower and Fifth Avenue Hospitals, New York.)

hands wrists and forearms but they may occur at any site. In a 2 year-old patient of my own *the lesion was localized to the right side of the face* (Fig. 20)

Nummular eczema should be differentiated *from tinea circinata* contact dermatitis, atopic dermatitis and dermatitis herpetiformis. *Tinea circinata* is characterized by a raised peripheral border of vesicles the lesions spread peripherally and clear in the center Culture of the lesion will disclose the presence of fungi *In contact dermatitis* usually the lesion is not so sharply demarcated as in nummular eczema and of course, a history of the responsible contactant is often elicited. In *atopic dermatitis* the plaque merges gradually into the normal surrounding skin, in contrast to nummular eczema, with its sharp line of demarcation Furthermore, pruritus is milder in the latter than in the former It will not be difficult to differentiate it from the typical form of *dermatitis herpetiformis* (Duhring's disease) characterized by a polymorphous eruption typical distribution over the intrascapular region or the sacral area, severe itching chronicity and hyperpigmentation. *In infants and children however the clinical picture of Duhring's disease may vary and in difficult cases biopsy may be necessary to establish the diagnosis.*

The condition may be resistant to treatment Nevertheless it frequently responds satisfactorily to one of the tars. *Oil of cade (Juniper Tar U.S.P.)* is a favorite remedy Hill claims fair therapeutic results from painting each lesion *with crude coal tar once a day* In general, the plan of management is similar to that of atopic dermatitis. Wet dressings are indicated during the acute exudative stage and mild tar preparations should be used during the chronic recalcitrant stage.

See Formulary ℞ 33

Circumscribed Neurodermatitis

This condition is infrequent in young children but it does occur The lesions consist of a single or several plaques of circumscribed, lichenified skin slightly elevated above the surface and with a well defined border (Fig. 21) It has the typical leathery dry appearance common to the lichenified plaques so often seen in adults and among older children with chronic eczema. The condition may be brought about by constant scratching of the areas affected or by rubbing

The most useful remedy is one of the tars. The writer has found 0.5 to 1 0 per cent pine *tar with 0.5 per cent* salicylic acid in equal parts of rose water ointment and zinc oxide ointment very useful Roentgen ray therapy in *dosage of ½ skin unit* has also been found helpful, both for relieving the itching and for causing the lesions to involute.

See Formulary ℞ 33

CONTACT VARIETY

Nonatopic and Atopic

The clinical pictures of true atopic dermatitis and contact dermatitis are sometimes so similar that it is often impossible to tell with any degree of certainty whether the condition is one or the other Both conditions frequently show marked erythema with papules, vesiculation and weeping (edema) The distinction at least theoretically lies in the fact that the shock organ in contact dermatitis lies within the epidermis whereas in atopic dermatitis it is located in the smaller capillaries in the upper corium (Fig. 22) A clue to the etiologic factors may be provided by patch tests in contact dermatitis, and by scratch tests and intradermal tests in atopic dermatitis.

There have been instances in which egg-white or even the contact of an egg shell with the skin of an egg-allergic infant has produced the classical clinical signs of atopic dermatitis. The possible explanation is that the offending allergen enters the skin through the epidermis into the corium (transepidermal penetration) Similar instances have been known to occur with patients who are silk sensitive and wool sensitive where such materials have been in contact with their skin The reaction of the skin resulting from contact with such substances varies from a mild to severe erythema with

to Jadassohn in 1894 but it was used before that time in France and in England. Sir Kenelme Digby of London in 1645 recognized the fact that certain people had "antipathies" or "sympathies" against certain substances, thus establishing the fact that allergies were known even at that time. The diagnostic patch test is based on the theory that if dermatitis is caused by hypersensitivity to a certain substance, then, if that substance is placed in contact with the unaffected skin of the susceptible individual and allowed to remain on for a period of time, it will cause an inflammatory reaction at the site of contact.

It is obvious that the diagnostic patch test should not be performed with such concentrations of substances as will cause reactions on any skin; i.e., with primary skin irritants. However diagnostic patch tests can be performed with such dilutions of primary irritants as will not cause a reaction on the nonallergic or nonhypersensitive skin.

Reactions to the patch test depend on four factors (1) the degree of sensitivity of the patient, (2) the concentration of the test substance used for patch testing, (3) the length of time it contacts the skin, and (4) the actual amount of the substance per area of the skin. In performing patch tests it is best to apply constant amounts of the test substance to constant areas of the skin for constant periods. In performing a diagnostic patch test it is best to have a control substance placed on the opposite side of the body in a manner similar to that of the test substance.

Patch tests may be closed (i.e., sealed onto the skin by adhesive plaster) or open (i.e., applied to the skin and exposed to the open air). The open patch tests should be performed with substances such as dyes, lacquers, and paints, which, when applied to the skin, will remain there. The closed diagnostic patch test is performed as follow. With liquids, saturate a piece of 4-ply gauze one inch square and apply it to the uninflamed skin—on the arms, thighs, back, or front of body. The gauze should not be so saturated that the liquid trickles from the patch site. A 2-in. square piece of nonwaterproof cellophane is used to cover the gauze. This is then sealed to the skin with adhesive plaster about 3 in. square. After being on the skin from 24 to 72 hours, the patch is removed and the site of contact with the test substance is inspected. There is usually some reaction to the adhesive plaster but where the cellophane touches the skin there is an area of uninflamed skin. In the center of the patch, where the gauze was in contact, there is an inflamed area if the patch test is positive. Sometimes the whole area covered by the cellophane is inflamed if the liquid on the gauze has spread over that area. In order to be sure that the patch testing was not done with a primary skin irritant, a similar patch is placed on the skin of a nonallergic person (physician or nurse) and a piece of surgical gauze is applied to the skin of the test subject on the other side of the body as controls.

In performing patch tests with powders, the powder is placed on a piece of wet gauze to hold the powder in place and the whole is then covered with cellophane and the 3-inch square of adhesive.

When solids insoluble in water are used they can be dissolved in a solvent and a piece of gauze can be immersed in the solvent and then allowed to dry thus precipitating the insoluble substance on the gauze, which can then be placed on the skin as above.

When patch testing with ointments a dab of the ointment can be placed on piece of gauze which can then be applied to the skin, covered with cellophane and sealed onto the skin.

When patch testing with fabrics 1-in. square or circle of the fabric may be applied to the skin and sealed on with adhesive plaster

Open diagnostic patch testing.—It is evident that covered patch tests with high concentrations of primary irritant such as acids, alkalies or solvents are not diagnostic for allergy because they will cause reactions on most skins. Consequently cosmetics such as hair wavers, hair dyes, shampoos, hair lacquers hair tonics and nail lacquers, which may contain irritant concentrations of primary irritants or irritant solvents, are not suitable for patch testing because in actual usage these substances are not sealed onto the skin and the solvent evaporates.

A list of concentrations of chemicals used for patch testing can be found in Schwartz, L., Tulipan, L. and Birmingham, D. J. *Occupational Diseases of the Skin* (3d ed. Philadelphia: Lea & Febiger, 1957), pp. 70-85.



Fig. 22.—Contact dermatitis. Histologic section of skin shows very acute process with streaming of edematous fluid through interstitial spaces. Note remarkable preservation of cells seen floating in vesicles. In some areas the intracellular bridges have not yet broken despite the massive edema. Acute vascular dilatation and a banal inflammatory cellular infiltration are present in the cutis.

vesicular and even bullous lesions, depending on the kind of material and the length of exposure to the contactant This type of allergy differs from a true allergic type of atopic dermatitis in that there is no family history of allergy in contact dermatitis (nonatopic) and that the scratch and intracutaneous tests frequently produce negative results, as may also the passive transfer test

The list of offenders in nonatopic contact dermatitis are many and include wool, silk rayon medicated soap aniline dyes (colored socks underwear etc.) medicated baby oil. Ammoniacal diaper dermatitis is another example of a contact dermatitis Many proprietary ointments lotions and creams are responsible for a so-called therapeutic (traumatic) contact dermatitis.

Prophylaxis consists in searching for and eliminating the offending contactant. Patch testing is an important aid in prevention However it should be remembered that a negative result does not exclude the possibility that the tested substance is responsible for the dermatitis.

In *treatment* wet dressings are indicated for the acute exudative stage, to be followed later by mild astringents and antiphlogistic remedies. After the edema has subsided simple Lassar's paste, to which may be added 0 1 per cent menthol and 0.5 per cent salicylic acid is often serviceable.

THE PATCH TEST*

Patch tests can be used as a *diagnostic* procedure to find the irritant in a case of contact dermatitis or it can be used for the purpose of foretelling or prophesying whether a substance will or will not cause a dermatitis when it comes in contact with the skin. The first is called a diagnostic patch test and the second the prophetic patch test

The *diagnostic patch test* has been attributed

* Contributed by Dr Louis Schwartz, Washington, D C.

to Jadassohn in 1894 but it was used before that time in France and in England. Sir Kenelme Digby of London in 1645 recognized the fact that certain people had "antipathies" or "sympathies" against certain substances, thus establishing the fact that allergies were known even at that time. The diagnostic patch test is based on the theory that if dermatitis is caused by hypersensitivity to a certain substance, then, if that substance is placed in contact with the unaffected skin of the susceptible individual and allowed to remain on for a period of time, it will cause an inflammatory reaction at the site of contact.

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OPEN DIAGNOSTIC PATCH TESTING.—It is evident that covered patch tests with high concentrations of primary irritant such as acids, alkalies or solvents are not diagnostic for allergy because they will cause reactions on most skins. Consequently cosmetics such as hair wavers, hair dyes, shampoos, hair lacquers, hair tonics and nail lacquers, which may contain irritant concentrations of primary irritants or irritant solvents, are not suitable for patch testing because in actual usage these substances are not sealed onto the skin and the solvent evaporates.

A list of concentrations of chemicals used for patch testing can be found in Schwartz, L., Tulipan, L., and Birmingham, D. J., *Occupational Diseases of the Skin* (3d ed. Philadelphia: Lea & Febiger, 1957), pp. 70-85.

Therefore if a dermatitis is suspected to be due to such a cosmetic, the test should be an open patch test. The open patch test is best performed on a sensitive part of the skin such as the bend of the elbow the popliteal space, and the skin behind the ears. The test cosmetic is applied to about 1-in. square of skin and left uncovered and the patient is instructed not to wash it off or in any way remove it. The site of the patch is inspected at the end of 24 hours and if there is no reaction the cosmetic may be again applied to the same site of skin and again inspected at the end of 24 hours. A third application may be made and if there is no reaction the patient is definitely not hypersensitive. It is well to use a known nonirritant brand of a similar cosmetic as a similar patch on a corresponding area on the other side of the body to serve as a control.

There have been many modifications suggested for the diagnostic patch test. They include the use of collodion instead of adhesive plaster placing of a 1-in. square microscopic slide over the test substance and fixing the glass to the skin by adhesive and Scotch tape has been advocated instead of adhesive. In some instances I use 2-in. squares of elastic patches which have a 1 in square of gauze in the center

INTERPRETATION AND READING OF PATCH TEST —There are degrees of reactions when the patch tests are positive (Fig. 23) A simple erythema that does not disappear after several hours and which sometimes becomes eczematized is graded as +1 When there is erythema and edema of the patch test site, it is graded as +2. When there are vesicles at the patch test site, it is graded as +3 And when there is actual ulceration, it is graded as +4 However any degree of reaction means hypersensitivity of the patient, especially if there is no reaction on the control subject.



Fig. 23.—Positive patch test reactions. A, a +3 reaction to paint. Note vesicular elements. B a +4 reaction to fabric. (*B* courtesy of Dr Louis Schwartz.)

Sometimes there is a faint redness at the site of the patch which is not sufficient to grade as +1 but it still is different in color from the skin where there was no patch. Such reactions should be inspected both an hour or two and at the end of 24 hours after the patch is removed. If they have disappeared they can be called negative but if they still persist they should be regarded as positive.

A positive patch test means that the patient is hypersensitive to the test material at the time the test is made. In the presence of a skin eruption due to the test substance, there may be a flare-up of the eruption at the time of the positive patch test. A negative result of the patch test means that at the time the test was made the patient was not hypersensitive to the test material placed on the skin as patch test but it does not necessarily mean that the patient was not sensitive at the time that he contracted the eruption. Especially is this so if the eruption is fading, because by that time the patient may have developed a relative hyposensitivity to the substance. The result may also be negative because the patch test does not represent actual conditions under which the eruption was contracted. For instance, friction may have been present at the time the eruption was contracted and there is no friction in the patch test, also, perhaps a larger amount of the substance was contacted than is present in the patch test.

Serious systemic results from diagnostic patch tests are rare. Sometimes the eruption, if present or recently faded, may flare up. Sometimes the reaction may spread over a larger area than the test site. This author has seen only one case where there was an elevation of temperature with a positive patch test.

THE PROPHETIC PATCH TEST.—The use of the patch test for foretelling whether new fabric or cosmetic is safe for use by the public as first devised by this author who named it the prophetic patch test. It or some modification of it is now being used before new fabrics or cosmetics are placed on the market. The prophetic patch test consists of two series of patch tests carried out on the same individuals 10 to 14 days apart. The first series is for the purpose of determining whether the material is primary skin irritant and iso to induce sensitization The second series is for the purpose of seeing whether sensitization has been induced. Tw hundred subjects ar tested and control patch of similar material already safely used by the public is used as control. If there are any reactions from the new test substance and none from the control, then it can be said that the new test substance is more likely to irritate the skin tha is the control substance. If there are no reactions from the new test substance, then the f bric or cosmetic should be placed on trial sale in a small community for at least a month and any cases of dermatitis reported from it investigated to see if they are actually caused by the substance.

Dermatitis Venenata with Special Reference to Poison Ivy

Dermatitis venenata is an inflammation of the skin arising from contact with various substances, animal, vegetable or mineral, strong acids, alkalies, plants, the resins and oleoresins of plants and flowers, chemicals and drugs, such as ammoniated mercury chrysarobin.

The condition is also referred to as contact dermatitis, eczematous dermatitis, or allergic dermatitis. It may be well to dispel the confusion between dermatitis venenata and dermatitis medicamentosa, terms sometimes used loosely as synonyms. Dermatitis venenata means sensitization of the skin to some agent with which the skin has had external contact. Dermatitis medicamentosa, on the other hand, is sensitization of the skin by a drug or chemical introduced into the body

When a susceptible person is exposed to a contactant (allergen) as, for example, the ivy leaf, for the first time, nothing happens as a rule. Only on a second or repeated contact with that particular agent does the phenomenon recognized as "sensitization take place. The interval between the "taking exposure to the contactant and the first appearance of signs and symptoms may be 10 days or longer Accordingly individuals with poison ivy dermatitis, we may be sure, have had previous contact with the ivy plant.

Etiology.—Poison ivy dermatitis is not an atopy because there is no hereditary influence and sensitivity to Rhus can be induced in about 70 per cent of all persons. The common allergen in the eastern United States is Rhus radicans L. (eastern ivy) which resembles a shrub and is found in the grass, upon fences and in trees. Less common is Rhus toxicodendron L. (swamp sumac toxicodendron vernix) also a shrub, which grows only in swamps in the eastern United States. A common offender farther

west and on the Pacific Coast is Rhus vernix (Rhus lobata toxicodendron diversilobum western poison oak) which closely resembles Rhus radicans and is *common along roadsides* characterized by its clusters of red berries *It grows in the fall.*

Although poison ivy is usually seen in the summer and fall no particular *season is exempt.* The active principle (toxicant antigen) is an oleoresin found in the leaf stem and bark of the ivy plant, *in poison oak poison sumac and in* the stem and sap of the mango fruits. Poison ivy is *not communicable but is autoinoculable* that is the lesions may spread from one part of the body to another through the blood and lymphatic vessels or by touch Whether the vesicular content may spread the infection to uninvolved areas of the skin is uncertain. There is some evidence that direct contact with the ivy plant is unnecessary smoke from burning ivy leaves and insects have been incriminated

Clinical Picture—Usually the dermatosis is initiated by erythema or pruritus, which appear separately or together on exposed areas of the skin. The individual lesions are minute, thin-walled clusters of vesicles, usually upon the *dorsa of the fingers* and hands, although any part of the body may be involved (Fig. 24 *A*) *Occasionally* bullae are seen instead of vesicles. Erythema is intense. In severe cases the *entire face* including the skin of the eyelids and ears, is affected. The intense redness of the face and ears, with edema on the cheeks and *vesiculation* gives a *characteristic* appearance the pointed tip of the nose resembles a pout. *In moderate* and severe cases edema (weeping) of the lesions is a common occurrence (Fig 24 *B*)

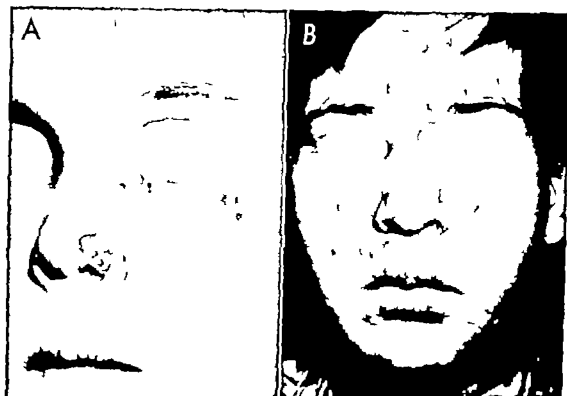


Fig. 24—Dermatitis venenata from poison ivy A, early lesions in girl 5 years of age. Note small grouped vesicles near corner of left eye and small erythematous crusted lesion on left nostril B in girl 1½ years of age Note marked erythema with severe edema on eyelids, nose and cheek.

Soon after exposure to the ivy plant there is a slight stinging sensation, followed by intense redness within 24 hours. The inflammatory reaction may be delayed for two or three days. Burning and itching with local discomfort are usually complained of during the height of the dermatosis, but the itching is not continuous, occurring in cycles.

Diagnosis.—The diagnostic features of poison ivy dermatitis are (1) papules or vesicles occurring in straight lines, usually in the pattern of scratch marks (Köbner phenomenon) (Fig 25 *A* and *C*) (2) distribution of the lesions, often helpful in diagnosis, generally on exposed areas of the body (3) an intense erythematous reaction of the skin with associated edema (weeping) although the eczematized character of the eruption may resemble ordinary eczema (Fig. 25 *B*) (4) history of sudden onset and exposure. A child who has been on a farm, in a cemetery or in a vacant lot and has an eruption on the exposed areas of the skin probably has poison ivy dermatitis.

Differential Diagnosis.—At times it is clinically impossible to differentiate *dermatophytosis* and poison ivy dermatitis. However sharply marginated lesions and limitation to one or two fingers are points in favor of dermatophytosis. Further dermatophytosis evolves slowly Microscopic examination of the vesicles of dermatophytosis will disclose mycelial threads and culture on Sabouraud's medium will yield the fungus. Dermatitis venenata caused by *chemicals, dyes, etc* does not differ greatly from the eruption of Rhus toxicodendron, except for the linear lesions of poison ivy dermatitis. A direct history of contact with dyes or chemicals and positive patch test with suspected contactants may aid in differentiation. With *atopic dermatitis* there is usually family history of allergy Antecubital and popliteal areas, the face and neck are common sites for atopic dermatitis. Too, its lesions are better or worse from time to time.

Complications.—Reactions, local and general, have been reported, including toxic rashes from the oral and parenteral use of Rhus extracts Intramuscular injections in oily vehicles may cause intense pain, edema and swelling. Perianal pruritus frequently results from extracts administered per os. Periarteritis nodosa has followed the dermatitis of poison oak and primrose, probably caused by sensitization to plant antigens. Poisoning has occurred in at least one case from an overdose of tincture of Rhus toxicodendron. Nephrotic syndromes and chronic glomerulonephritis following poison oak dermatitis, some fatal, have been reported.

Secondary infection characterized by impetigo contagiosa may result from scratching. The lesions frequently become eczematized.

Prognosis.—Uncomplicated poison ivy dermatitis is a self-limited disease. The average course is two to three weeks, seldom over a month. Recurrences are common.

Prophylaxis.—Children susceptible to poison ivy should be taught to recognize the plant by its three-pointed leaf. "Leaves three, let it be. As climber poison ivy may be confused with the Virginia creeper which has five-pointed leaves. Clothing, toys and pets which have been in direct contact with the oleoresin of the poison ivy plant may serve as a medium for transfer of the active principle to susceptible individuals.

Poison ivy plants can be destroyed by treatment with crude oil or by spraying with strong alkalies. Clothing or tools can be decontaminated by immersing them for 15 to 20 minutes in a 1 per cent solution of calcium hypochlorite. One of the best means for preventing poison ivy dermatitis after exposure is to wash thoroughly both exposed and unexposed areas of the skin with a strong alkali soap such as floor soap as soon as possible after contact. Another method, fairly successful, is to cleanse the skin immediately with 70 per cent alcohol.

Immunization.—While popular with many physicians, its value is controversial. Immunization by intramuscular injections with various extracts has not convinced me that it is worth the effort, time and expense, in either prevention or active treatment.

Treatment.—This includes use of topical remedies according to the stage of the disease. The *stage of edema* calls for continuous wet dressings, as for any acute exudative dermatitis. Continuous wet dressings of aluminum acetate solution (Burow's solution) are in order 1 part of the solution to 20 parts of water for older children, and 1 part of the solution to 30 parts of water for the younger child. Infusions of Matricaria (German chamomile) or 0 1 per cent silver nitrate solution are also serviceable as wet dressings for 24 to 72 hours. When there

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Two chemicals, ammonium sulfamate and 2-4-D (dichlorophenoxy acetic acid) will kill the whole plant, including the roots, when sprayed on the leaves. Neither is poisonous to animals nor particularly injurious to grass.

west and on the Pacific Coast is Rhus vernix (Rhus lobata toxicodendron *diversilobum* western *poison oak) which closely* resembles Rhus radicans and is common along road sides characterized by its clusters of red berries, *it grows in the fall*

Although poison ivy is usually seen in the *summer and fall* no particular season is exempt. The active *principle (toxicant antigen)* is an oleoresin found in the leaf stem and bark of the ivy plant, in poison *oak poison sumac and in* the stem and sap of the mango fruits Poison ivy is not communicable but is autoinoculable that is *the lesions may spread from* one part of the body to another through the blood and lymphatic vessels or by touch. Whether the vesicular content may spread the infection to uninvolved areas of the skin is uncertain. There is some evidence that direct contact with the ivy plant is unnecessary smoke from burning ivy leaves and insects have been incriminated

Clinical Picture—Usually the dermatosis is initiated by erythema or pruritus, which appear separately *or together on* exposed areas of the skin The individual lesions are minute, thin-walled clusters of vesicles, usually upon the dorsa of the *fingers and hands*, although any part of the body may be involved (Fig. 24 *A*) *Occasionally* bullae are seen instead of vesicles. Erythema is intense. *In severe cases the* entire face, including the skin of the eyelids and ears is affected The intense redness of the face and ears with edema on the cheeks and *vesiculation gives* a characteristic appearance the pointed tip of the nose resembles a pout. In moderate and severe cases edema (weeping) of the lesions is a common occurrence (Fig. 24 *B*)

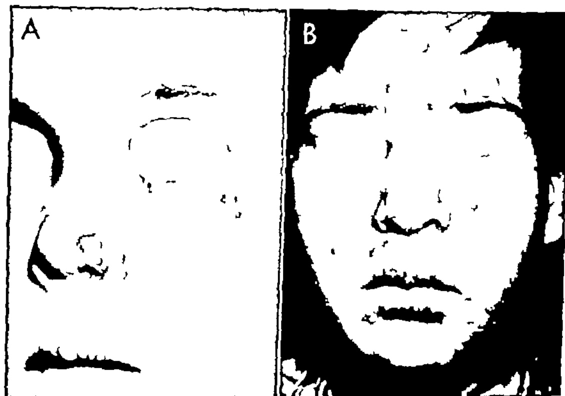


Fig 24—Dermatitis venenata from poison ivy A, early lesions in girl 5 years of age. Note small grouped vesicles near corner of left eye and small erythematous crusted lesion on left nostril B In girl 12 years of age. Note marked erythema with severe edema on eyelids, nose and cheek

Soon after exposure to the ivy plant *there is* a slight stinging sensation, followed by intense redness within 24 hours The inflammatory re*action may be delayed for two or three days.* Burning and itching with local discomfort are usually complained of during the *height of the* dermatosis but the itching is not continuous, occurring in cycles.

Diagnosis.—The diagnostic features of poison ivy dermatitis are (1) papules or vesicles occurring in straight lines, usually in the pattern of scratch marks (Köbner phenomenon) (Fig. 25, *A* and *C*) (2) distribution of the lesions, often helpful in diagnosis, generally on exposed areas of the body (3) an intense erythematous reaction of the skin with associated edema (weeping) although the eczematized character of the eruption may resemble ordinary eczema (Fig. 25 *B*) (4) history of sudden onset and exposure. A child who has been on a farm, in a cemetery or in a vacant lot and has an eruption on the exposed areas of the skin probably has poison ivy dermatitis.

Differential Diagnosis.—At times it is clinically impossible to differentiate *dermatophytosis* and poison ivy dermatitis. However sharply marginated lesions and limitation to one or two fingers are points in favor of dermatophytosis. Further dermatophytosis evolves slowly Microscopic examination of the vesicles of dermatophytosis will disclose mycelial threads and culture on Sabouraud's medium will yield the fungus. Dermatitis venenata caused by *chemicals*, *dyes*, *etc* does not differ greatly from the eruption of Rhus toxicodendron, except for the linear lesions of poison ivy dermatitis. A direct history of contact with dyes or chemicals and a positive patch test with suspected contactants may aid in differentiation. With *atopic dermatitis* there is usually a family history of allergy Antecubital and popliteal areas, the face and neck are common sites for atopic dermatitis. Too, its lesions are better or worse from time to time.

Complications.—Reactions, local and general, have been reported, including toxic rashes from the oral and parenteral use of Rhus extracts. Intramuscular injections in oily vehicles may cause intense pain, edema and swelling. Perianal pruritus frequently results from extracts administered per os. Periarteritis nodosa has followed the dermatitis of poison oak and primrose, probably caused by sensitization to plant antigens. Poisoning has occurred in at least one case from an overdose of tincture of Rhus toxicodendron. Nephrotic syndromes and chronic glomerulonephritis following poison oak dermatitis, some fatal, have been reported.

Secondary infection characterized by impetigo contagiosa may result from scratching. The lesions frequently become eczematized.

Prognosis.—Uncomplicated poison ivy dermatitis is a self-limited disease The average course is two to three weeks, seldom over a month. Recurrences are common.

Prophylaxis.—Children susceptible to poison ivy should be taught to recognize the plant by its three-pointed leaf Leaves three, let it be. As a climber poison ivy may be confused with the Virginia creeper which has five-pointed leaves. Clothing, toys and pets which have been in direct contact with the oleoresin of the poison ivy plant may serve as a medium for transfer of the active principle to susceptible individuals.

Poison ivy plants can be destroyed by treatment with crude oil or by spraying with strong alkalies.* Clothing or tools can be decontaminated by immersing them for 15 to 20 minutes in a 1 per cent solution of calcium hypochlorite. One of the best means for preventing poison ivy dermatitis after exposure is to wash thoroughly both exposed and unexposed areas of the skin with a strong alkali soap such as floor soap as soon as possible after contact. Another method, fairly successful, is to cleanse the skin immediately with 70 per cent alcohol.

Immunization.—While popular with many physicians, its value is controversial. Immunization by intramuscular injections with various extracts has not convinced me that it is worth the effort, time and expense, in either prevention or active treatment.

Treatment.—This includes use of topical remedies according to the stage of the disease. The *stage of edema* calls for continuous wet dressings, as for any acute exudative dermatitis. Continuous wet dressings of aluminum acetate solution (Burow's solution) are in order 1 part of the solution to 20 parts of water for older children, and 1 part of the solution to 30 parts of water for the younger child. Infusions of Matricaria (German chamomile) or 0.1 per cent silver nitrate solution are also serviceable as wet dressings for 24 to 72 hours. When there

*Two chemicals, ammonium sulfamate and 2-4-D (dichlorophenoxy acetic acid) will kill the whole plant, including the roots, when sprayed on the leaves. Neither is poisonous to animals nor particularly injurious to grass.



Fig. 25 —Dermatitis venenata from poison ivy *A*, typical skin reaction from sensitization by poison ivy oleoresin (toxicodendric acid) Note marked erythema, edema and bullae Vesicular lesions in linear arrangement on dorsum of hand is the Köbner phenomenon. *B* note moderate sized bullae on legs and thighs. *C*, Köbner phenomenon on forearm appeared the day after the blister on the left hand which occurred five days after contact with the ivy plant. (*A* courtesy of Mr William J Taylor and Mr W Jackson Taylor Department of Photography Temple University School of Medicine)

is secondary infection, continuous wet dressings of potassium permanganate (1 10,000 for older children; 1 20,000 for younger children) are most serviceable.

For the *subacute* and *later stages* no specific topical remedy is available for poison ivy dermatitis. The most that can be expected after the dermatitis has appeared is to prevent spread of the lesions and relieve the itching. Oxidizing agents such as ferric chloride, potassium permanganate and sodium perborate give questionable results. In the subacute stage use of a shake lotion, emulsion or vanishing type cream with antipruritics added is helpful. Calamine lotion with 0.5–1 per cent phenol is perhaps the most popular remedy

The antihistamines give doubtful relief of the pruritus. Corticotropin (ACTH) and cortisone have been used in hospitalized patients with severe rhus dermatitis when there were no obvious contraindications. Falk and his colleagues reported relief of severe pruritus within 12 to 36 hours and remarkable disappearance of marked edema and weeping overnight.

See Formulary ℞ 1 23 68 102, 117 for sleeplessness—a mild antipruritic and sedative for child 5 years of age 116 for itching (J B Howell)

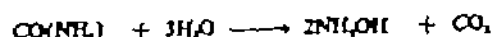
Diaper Dermatitis

(Ammoniacal Dermatitis, Erythema of Jacquet)

Diaper dermatitis is an acut inflammatory condition of the skin, frequently eczematous and generally localized to the external genitalia, but tocks and lower part of the abdomen—the so-called diaper area.

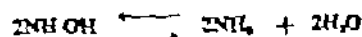
Based on the work of Jacquet, four types of diaper dermatitis are recognized (1) simple erythematous; (2) erythematovesicular or erosive (3) papular or posterosive (4) ulcerated forms. These types may be present singly or in combination in fact, all four types may be seen at the same time.

Etiology—The principal organism responsible for ammonia dermatitis is a saprophytic gram-positive bacillus (rod) which, originating in the feces, infests the skin of the diaper region. It has been shown that this organism is constantly present in the fecal discharges and that the urine is a good culture medium for it. Thus the ammoniacal diaper is a condition brought about by the splitting-off action of Bacillus faecalis (Bacillus ammoniagenes) on urea $CO(NH_2)_2$. The following chemical equation indicates the reaction involved



$$CO(NH_2)_2 + 3H_2O \longrightarrow 2NH_4OH + CO_2$$

Urea (Carbamate)	Hydrolizing effect of B. ammoniagenes (alkaline medium)	Ammonium hydroxide	Carbon dioxide



$$2NH_4OH \rightleftarrows 2NH_3 + 2H_2O$$

Ammonium hydroxide	Ammonia	Water

The proteus vulgaris, diphtheroids and other micrococci found in the intestinal tract, reacting with alkaline urine may also initiate the reaction.

A rash results which is localized to the area covered by the napkin namely the inner surfaces of the thighs, external genitalia and buttocks, but is sometimes spread to the legs and even the heels. It is the prolonged contact of the excretions with the skin that usually gives rise to the condition. One of the most common predisposing causes is the continuous use of rubber panties, which prevent evaporation of the urine. Strong alkaline soaps used to cleanse diapers have been incriminated the soap remaining in the diaper material and coming in close contact with the skin produces local inflammation as does ammonia.

Clinical Picture—The skin lesions (Fig. 26) may be erythematous or in severe cases, papulovesicular The erythema varies from mild redness to intense scarlatiniform discoloration with much swelling and local heat. I have seen acute cases in which the skin of the diaper area looked as though it had been scalded, resembling an acute burn like that of a freshly boiled lobster In such instances the volatile pungent odor of ammonia is quite obvious, even before the child is undressed for examination. If the local source of irritation is removed promptly the acute erythema disappears in a few days, although there may be a number of localized areas of superficial desquamation. Some areas may even show a wrinkled, cigarette-paper-like

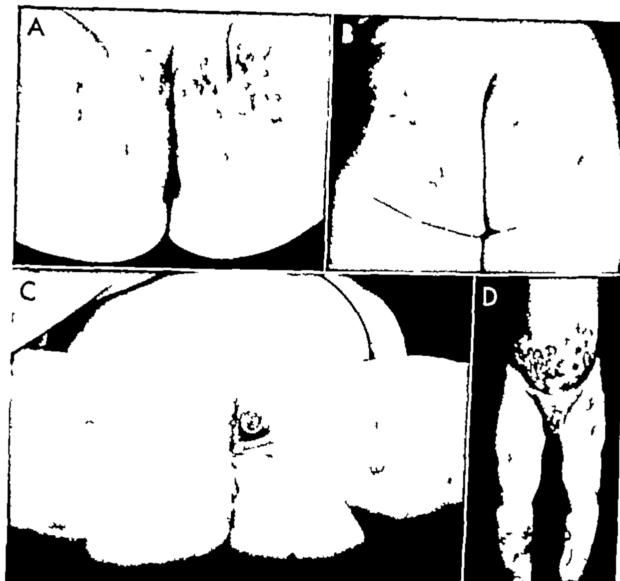


FIG. 26 —Diaper rash A, papulovesicular stage after two-week duration of rash in infant 17 months of age. Note numerous discrete lichenoid papules, which were reddish brown in color on external genitalia, suprapubic region and inner aspects of both thighs. In B note erythema and papules on buttocks of this 8-month-old infant. Lesions were also seen on posterior aspect of left thigh. In C, ulcerative stage in an infant 1 year of age after two-month duration of rash, note large ulcer (1 x 1 cm.) on left labia majora. A small ulcerated lesion appears below the larger ulcerated area with numerous satellite lesions surrounding the external genitalia and buttocks. In D the diaper rash is complicated by secondary infection (impetigo contagiosa) (Courtesy of Dr C S. Wright and Dr J P Guequierre)

appearance. With healing, however the redness subsides and new skin is formed.

In severe cases, the reaction may consist of actual blisters (vesicopapular) raised oval vesicles or bullae or lenticular shapes of a reddish to pinkish appearance. After these rupture, superficial eroded surfaces may be seen It is the resulting configuration that may lead the uninitiated physician to believe that he is dealing with congenital syphilis. Frequently a number of ulcerated lesions lying close together becoming confluent give rise to a polycyclic pattern. Too the clinical picture often becomes eczematized or impetiginized so that impetigo contagiosa is superimposed on the primary condition. Hyperpigmentation may be seen especially in dark-skinned infants Itching generally mild is experienced during involution.

Diagnosis.—Diagnosis is comparatively simple. An acute erythematous rash appearing in the older infant upon the buttocks, over the external genitalia and on the lower half of the abdomen, and characterized by papules, vesicles or vesiculopapules, with or without sharply marginated superficial punched-out ulcers, is generally an ammoniacal dermatitis. The pungent odor of ammonia is characteristic.

Differential Diagnosis.—Ammonia dermatitis must be differentiated from congenital syphilis, intertrigo, dermatophytosis (tinea cruris) and seborrheic eczema. Even competent observers may mistake it for *congenital syphilis*. However the lesions of the latter are to be found on other areas of the body and the skin, such as the forehead and face, and are infiltrated. Furthermore, desquamation of the palms and soles occurs in the syphilitic infant, there are other concomitants such as rhinitis (snuffles) and rhagades, and the liver and spleen are almost invariably enlarged. Finally the syphilitic infant shows signs of the disease soon after birth. A history of syphilis in one or both parents and a positive blood reaction clinch the diagnosis. *Intertrigo* is limited to the flexural folds, intercrural areas, folds of the neck, axillae, popliteal areas, etc., whereas in diaper dermatitis those areas are almost never affected. *Tinea cruris* is seldom seen in infants. The lesions are sharply marginated, and scrapings of the lesions examined in potassium hydroxide solution disclose mycelial threads; culture on Sabouraud's medium is positive. *Seborrheic eczema* during infancy is characterized by greasy scales on the scalp and other areas of the skin richly endowed with sebaceous glands, such as the umbilicus, eyebrows, axillae, nasolabial folds and root of the nose.

Complications.—Secondary infection with resulting pyoderma is sometimes seen.

Prognosis.—The condition responds promptly to hygienic care, but recurrences are common.

Management.—Diaper dermatitis is best managed by prevention. Instead of rubber material, Softex or stork sheeting should be used. Let the soiled napkin be removed as soon as the condition is discovered and the diaper region be kept as dry as is reasonably practical. Formerly prevention of diaper rash was attempted by the internal administration of such salts as acid phosphate of soda or ammonium chloride, with the intention of rendering the urine acid and keeping it so (for B. ammoniagenes acts only in the presence of alkaline urine) or by saturating the diaper with a mild antiseptic, such as boric acid or bichloride of mercury. However the possibility of poisoning by the accidental swallowing of either of the latter chemicals kept in the household has increasingly militated against their use. The introduction of quarternary ammonium compounds has given new safe remedies that make the earlier ones entirely dispensable. One of these, possessing germicidal properties, Diaparene (para-di-isobutyl-erosoxy-ethoxy-ethyl-dimethyl-benzyl ammonium chloride monohydrate) is both easy to use and effective.

℞
Diaparene Tablets No. XX
Signa: Dissolve one tablet in 2 qt. warm water to make approximately 1 25,000 solution. Place as many as six diapers in suitable basin and pour Diaparene solution over them. Allow the diapers to soak in the solution few minutes, then wring out and allow to dry

Stephens, Cook and Heberburg have advocated a newer chemical known as o-benzyl-p-chlorophenol which resembles hexachlorophene in being highly compatible with soaps and cations. It has low toxicity both orally and cutaneously with no evidence of absorption through the skin, but it is highly toxic to both gram-positive and gram-negative bacteria and to fungi. Another advantage is its non-sensitizing properties. Furthermore, it can be used in both hard and soft water

Treatment.—Once the source of the irritation has been removed, the eruption heals spontaneously. When the lesions are acutely eczematized, a wet dressing or an infusion of chamomile flowers or 1 30 aluminum acetate solution (Burow's solution) is indicated. The following prescription has been used with excellent results

℞

Bismuth subcarbonate	8 0
Peruvian balsam (4%)	4 8
Benzocaine	4 0
Zinc oxide ointment q.s. ad	120 0

Misce et fiat unguentum
Signa: Apply freely
Indication: Antiphlogistic, healing

See Formulary ℞ 34

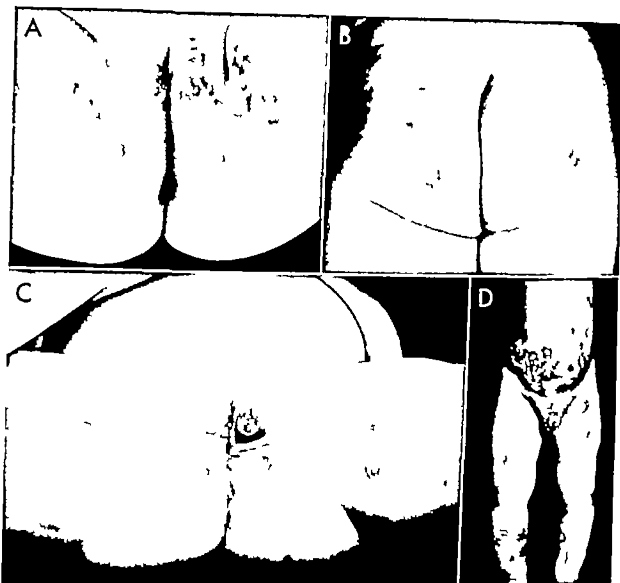


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Treatment.—Once the source of the irritation has been removed, the eruption heals spontaneously. When the lesions are acutely eczematized, a wet dressing or an infusion of chamomile flowers or 1:30 aluminum acetate *solution* (Burow's solution) is indicated. The following prescription has been used with ex*cellent results*.

℞

Bismuth subnitrate	3 0
Peruvian balsam (4%)	4 8
Bentonite	4 0
Zinc oxide ointment q. ad	120 0

Misce et fiat unguentum
Signa: Apply freely.
Indication: Antiphlogistic, healing.

See Formulary ℞ 34

Seborrheic diaper reaction.—This eruption (named "psoriasoid" by Tachau Jadassohn) apparently occurs only as a complication of ammoniacal diaper reaction which it may follow within a few days or sometimes a month after the ammoniacal reaction has first been noticed. It affects regions particularly well endowed with sebaceous glands. The eruption (Fig. 27) begins as small erythematous macules or papules which in a few days enlarge to form a well-defined erythematous plaque. The acute redness of the rash is striking. The eruption is definitely marginated and usually scaly. It is dry except for occasional evidence of eczematization with weeping of lesions in intertriginous areas.

Treatment consists in the application of mild keratoplastic, antiphlogistic and antiseborrheic topical remedies, e.g., a 1.5 per cent Vioform in the form of ointment or cream. Soap and water should be avoided.

Intertrigo
(Chafing)

Intertrigo is a hyperemic, inflammatory condition of the skin characterized by intense redness and found in areas of the skin that are in apposition. The condition, common in infants, particularly the obese, is caused by hypersecretion and retention of sweat. Primarily it is due to excessive perspiration with constant friction of the affected parts increasing heat. Urine

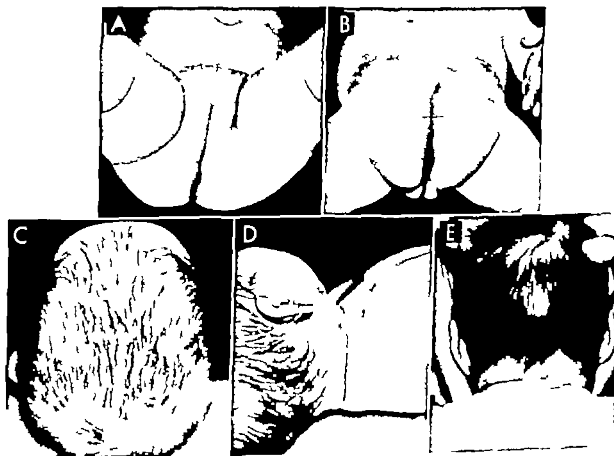


Fig. 27.—Seborrheic diaper reaction in 6-month-old infant precipitated by an ammoniacal dermatitis (diaper rash) and "seborrhids" that followed the initial rash on the external genitalia, thighs and buttocks. This condition is of frequent occurrence but is apt not to be recognized. The infant was first seen with a diaper rash at 3 weeks of age (A, and B). Three weeks later (C, D, E) a reddish brown eruption was noticed on scalp, neck, axillae, umbilicus and trunk. Repeated cultures for fungi including culture for *Candida albicans*, yielded negative results. Note the classical scaly lesion on the scalp (cradle cap) and those characteristic of seborrheic dermatitis on the posterior region of the neck, the trunk and other areas.

feces and improper cleansing of the parts may also be causative factors.

Clinical Picture.—Intertrigo is characterized by an intensely red, dry and shiny skin, hot to the touch, and generally limited to regions where the skin comes in contact with other skin (Fig. 28). In the newborn, the gluteal folds are especially affected. Any and all joint folds may be involved. It may extend to the smooth parts of the back, arms, legs and even the heels. In more advanced cases, edema (weeping of the lesions) is present. Then, instead of the smooth, glistening redness, there may be papules and papulovesicles, especially upon the buttocks. The affected areas frequently become eczematized, showing maceration and sogginess, and are then characterized by a strong offensive odor of butyric acid. Secondary infection and fissuring is common. Young infants are restless and uncomfortable. Older infants and young children may rub and scratch the affected parts. There are no constitutional symptoms.

Diagnosis.—An intense redness on the folds of the skin, with or without edema and seen particularly in overfed babies and obese children, is generally intertrigo. It must be differentiated from monilial and other mycotic infections. Although monilial infection closely simulates intertriginous eczema, culture on Sabouraud's medium and on cornmeal agar will help to differentiate the two conditions. Culture on Sabouraud's medium is the differential test for other mycoses also. Furthermore, in both monilial and other mycotic infections, the inflammatory reaction of the skin is more intense than in intertriginous eczema.

Complications and Prognosis.—Pyoderma may occur and, rarely, lymphangitis. Sabouraud demonstrated that intertriginous eczema is complicated by the streptococcus. The prognosis is good. Improvement follows promptly after proper hygienic care and topical therapy are instituted.

Prophylaxis.—Prevention consists in the proper hygienic care of the folds and creases of the skin in the daily routine management of all infants and children. Careful attention should be directed to hygienic care of excretions, especially when diarrhea is present. The soiled diaper should be changed frequently and the parts kept as dry as is reasonably possible. Strong alkaline soap should be avoided, instead a hyperoliated or superfatted soap should be used and the parts cleansed with applications of warm olive oil.

In poorly nourished infants an attempt should be made to improve the nutrition. A



Fig. 28.—Intertrigo in 6-month-old infant. Note erythematous, soggy appearance of skin over posterior fold of neck with number of vesicles.

well balanced diet with adequate vitamins and rest should be provided routinely. Inorganic iron is called for if secondary anemia is present. In obese and overnourished infants the fat of the diet should be reduced.

Treatment.—Ointments should be avoided. Affected areas should be kept separated by layers of gauze, lint, absorbent cotton, lamb's wool or strips of adhesive tape to minimize the friction and facilitate healing. Healing is prompt once the mechanical irritation and excessive perspiration are overcome. For the edema (wet stage) wet dressings of an infusion of chamomile flowers or of an aluminum acetate solution 1:30 continuously applied during the day for two or three days, lead to rapid improvement. On finishing with the wet dressings, a simple paste such as Lassar's paste should be applied



Fig 29 —Acute infectious eczematoid dermatitis. A, of the face following mastoidectomy B of th left leg (another patient) of five weeks duration *following a mosquito bite. Note central area* o necrosis, hyperpigmentation (common in Negroes) and crusts surrounding central lesion (*A* courte of Dr C. S. Wright and Dr J P Guequierre.)

for another 24 to 48 hours Simple shake lotions should be applied preferably with a paint brush An incandescent lamp is valuable for hastening improvement. A fine unscented talc *or dusting powder should be used after the bath.* It may be employed alone or in combination *with equal parts of zinc stearate, zinc oxide and bentonite*

When secondary infection complicates intertrigo wet dressings of a 0 1 per cent solution of silver nitrate or a tub bath of silver nitrate in the same strength both soothes and facilitates healing of the lesions

Bran starch kaolin and Aveeno baths have been useful both for cleansing the skin and for soothing the inflamed parts

Representative Prescription

℞

Peruvian balsam	1 0
Sodium borate	2 5
T lc	10 0
Petrolatum	50 0

Misce et fiat nguentum
Signa Apply freely pon strips of gauze
Indication Antiphlogistic

(*Kleinschmidt*)

See Formulary ℞ 4 for recalcitrant cas (antiphlogistic and astringent) 71 for secon ary infection (*pyoderma*) 75 *especially* usef for intertrigo behind ears.

Infectious Eczematoid Dermatitis
(Dermatitis Infectiosum Dermatoides)

This condition *first described by Fordyce o* New York and by Engman of St. Louis inde pendently *is* a secondary eczema *usually in* duced by an exudate upon any part of the body from any cause (Fig. 29) Examples are to be found in boils, abscesses draining sinuses, dis charging ears, leg ulcers or an osteomyelitic abscess discharging pus which spreads periph erally and sensitizes the adjacent skin with resulting eczematoid eruption

Treatment —Treatment consists in overcoming the primary condition. Bland ointments such as the 1 2 3 ointment (aluminum acetate solution 10 parts, anhydrous lanolin, 20 parts, and simple Lassar s paste 30 parts) are employed to protect the surrounding normal skin

from irritation and possible subsequent sensitization. When the lesions are exudative, wet dressings are indicated.

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11

Urticarias, Toxic Erythemas and Drug Eruptions

THIS GROUP of dermatoses is of particular interest to the dermatologist because of the many bizarre etiologic factors involved A considerable number of such reactions are undoubtedly allergi Furthermore, many of them are self limited. With the exception of the immediate care of the acute phase of the disturbance—for example the use of adrenalin for angioedema and treatment of the anaphylactoid state arising from drug reaction—the physician s primary mission is to avoid the use of measures that might interfere with restoring a sick skin to normal Pruritus must of course be minimized or overcome by appropriate topical measures and a highly inflamed and irritated skin must be soothed The comfort rest and adequate sleep thus provided for the patient will do much toward improving the immunologic-biologic state of an altered skin Most important of all of course is the fact that drug reactions are preventable, in most instances, if it is made clear on the patient s record whenever an untoward effect is noted from administration of a drug

The hi topathologic findings in the erythema group of dermatoses are important and of clinical significance inasmuch as they help to explain many of the clinical features of the disease. Thus while the histopathologic picture in erythema multiforme varies with the clinical aspect of the dermatosis there are certain features common to all types When the lesions are of the maculopapular type the epidermis shows spongiosis and intracellular edema. The corium is edematous and an inflammatory infiltrate the severity of which varies according to the clinical manifestations is found to appear around the blood vessels. The perivascular infiltrate is composed mainly of lymphocytes (small round cells) and histiocytes but it may also contain neutrophils and eosinophils In common with all toxic erythemas the blood vessels in erythema multiforme and related dermatoses bear the brunt of the reaction In the more severe forms the blood vessels are greatly dilated and the tunics of the blood vessels may be washed out the endothelial cells of the blood vessels appear prominent and there may be an extravasation of erythrocytes into the corium It is the great dilatation of the blood vessels that accounts for the erythema of the skin When bullous lesions occur they are seen histopathologically as edema in the upper corium and in the squamous cells of the rete malpighii. In severe cases the edematous fluid pushes the epidermis away from the upper layers of the corium much in the same manner as a lid through pressure is pushed away from a box Histopathologically this finding is referred to as a sub-epidermal bulla but bullae in this disease may also occur in the epidermis (intra epidermic bullae) resembling the histopathologic picture of a contact dermatitis.

Urticaria

(Hives, Nettle Rash)

Urticaria is an allergic skin reaction characterized by the sudden appearance of elevated, whitish, evanescent wheals that are edematous and surrounded by an areola of redness. The condition is accompanied by an intense itching, burning or stinging.

Classification.—ACUTE URTICARIA.—In the acute type, the skin manifestations last for a few days to a few weeks, then disappear completely presumably because contact with the etiologic agent has ceased.

CHRONIC URTICARIA.—In the chronic type, the skin manifestations persist for many weeks, often months, and the course is characterized by disappearance of the wheals, soon followed by second series of eruptions. Although positive reactions to skin tests with food allergens are not always to be obtained discovery of the particular allergen and its withdrawal often results in improvement. Unusual types include hemorrhagic urticaria and urticaria followed by pigmentation. In children urticaria is frequently accompanied by vesicles or bullae surrounded by a halo of erythema.

Etiology.—Exogenous and endogenous agents of many kinds may be responsible. It is believed that the symptoms are the result of an antigen-antibody reaction and that the antibodies are localized in the superficial capillaries located in the corium, referred to as "the shock organ. When antigen meets antibody and unites with it, urticaria results. Allergens may enter the body by ingestion contact, inhalation or injection.

Urticaria may be caused by the ingestion of foods, and this type is of greatest concern to pediatricians. Common food offenders are eggs, milk, wheat, chocolate pork, shellfish, fresh-water fish, berries (particularly strawberries) cheese and nuts. Drugs, among them the iodides, bromides, quinine, ipecac, barbiturates, salicylates, antipyrine phenolphthalein and opium derivatives, especially morphine, are notorious offenders. Bacteria in foci of infection, intestinal parasites insect bites, pollens, serums and such physical agents as heat, cold and light, all may be responsible. Vasomotor instability may precipitate an attack. Woolen fabrics, through contact with the skin, also may be responsible.

Urticaria is seen at all ages and in both sexes, although some authorities claim it to be more common in the female. Statistics regarding the incidence of a family history of allergy vary widely.

Clinical Picture.—The wheal is the primary lesion and establishes diagnosis. It is an elevated, edematous, sharply demarcated, opaque white lesion surrounded by a rose-colored or red areola (Fig. 30). It may be round, oval or polycyclic, of firm consistency in various sizes and shapes, and it may vary in size from a five-cent piece to a plum or larger. The lesions are evanescent, disappearing after a few minutes or several hours without residual effects.

Urticaria may be localized or generalized and may appear anywhere on the body. Usually the lesions are multiple. Areas of predilection are the trunk, extremities, palms and soles, face scalp and eyelids. Dermographism (Fig. 31) frequently associated with hives, is produced by gentle stroking of the skin with a blunt object that causes a raised red streak (linear) which fades to a pink line. The most important complaint is of itching, which, though varying in severity is invariably present. Other local discomfort, as burning sensation of the skin, formication or a more generalized feeling of heat, may be present and account for the scratching.

Constitutional symptoms are unusual although malaise, headache and gastrointestinal derangement are occasionally seen, and fever sometimes precedes or accompanies the rash.

Diagnosis.—The most important single sign is the appearance, quite suddenly of edematous, smooth or irregularly shaped elevations of the skin (wheals) of different sizes and covering more or less extensive areas of the trunk. The most important single symptom is pruritus.

Differential Diagnosis.—Diagnostic confusion arises only when the urticaria is accompanied by vesicular and bullous lesions, but this is rare. In these instances urticaria must be differentiated from dermatitis herpetiformis and vesicular lichen planus. Also, it is occasionally confused with scabies, prurigo erythema multiforme and insect bites.

11

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THIS GROUP of dermatoses is of particular interest to the dermatologist because of the many bizarre etiologic factors involved A considerable number of such reactions are undoubtedly allergic. Furthermore, many of them are self-limited. With the exception of the immediate care of the acute phase of the disturbance—for example the use of adrenalin for angioedema and treatment of the anaphylactoid state arising from drug reaction—the physician s primary mission is to avoid the use of measures that might interfere with restoring a sick skin to normal Pruritus must of course be minimized or overcome by appropriate topical measures and a highly inflamed and irritated skin must be soothed. The comfort rest and adequate sleep thus provided for the patient will do much toward improving the immunologic biologic state of an altered skin Most important of all, of course, is the fact that drug reactions are preventable, in most instances if it is made clear on the patient s record whenever an untoward effect is noted from administration of a drug

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sensitization) over a long period may overcome allergies due to foods. When woolen cloth is the cause, wool should be replaced by heavy cotton.

Treatment.—Foods and medicaments suspected to be causative should be discontinued. *It is frequently advisable to institute a simple dietary regimen for a few days or a week, during which time only vegetables, broths, gruels and toast are permitted.* When certain foods are suspected, the patient should be placed on an elimination diet, then gradually as one food at a time is restored, its effect in the way of urticarial reaction may be observed.

In some individuals, substitute foods often serve a useful purpose, for example, when cow's milk is the offender, evaporated cow's milk or goat's milk may be substituted. Too stewed fruits and cooked vegetables may serve in place of raw ones.

There is no proof that calcium per os or by intramuscular or intravenous injection has any therapeutic value. The antihistamines sometimes cause improvement, but no single antihistamine can be specific for all cases of urticaria. *When one fails, another should be tried.* I have had good results with Benadryl, Pyribenzamine and Thephorin, although at times they have failed. One or more of the antihistamines in combination seems better for some patients than any one used alone. The dosage varies according to the age and weight of the child. For infants, 10 mg. of the drug is administered per os every three hours; for older infants, 20 or 30 mg. and after age 5 years, 50 or 100 mg. every three hours is adequate. The elixir is satisfactory *for infants* and young children. After age 5 capsules or tablets may be prescribed.

Autohemotherapy sometimes works very well in recalcitrant urticaria. No more than 10 cc. of blood should be introduced into the buttocks. I have found intramuscular injections of 0.5–1.0 cc. of crude liver extract, 0.25–0.5 cc. of typhoid-paratyphoid vaccine, repeated daily for two or three days, quite helpful. Epinephrine chloride solution (1:1000) in doses of 0.1–0.3 cc. subcutaneously may be tried in acute cases. *It may be repeated once or twice* within a few hours. This dose is followed by ephedrine hydrochloride from 15 mg. (¼ gr.) to 25 mg. (⅜ gr.) or 30 mg. (½ gr.) given orally in the form of tablets or powders every 4 to 6 hours depending on the age and weight of the child. Tincture of belladonna in drop doses, 0.06 cc. three times daily and increased to the point of physiologic effect (flushing of the face, dryness of the mouth and dilatation of the pupils) has at times yielded good results.

I have had little success with desensitization to histamine or its azo protein.

LOCAL THERAPY.—The aim of local treatment is to overcome discomfort by the use of antiphlogistic and antipruritic remedies. These may be evaporating and cooling wet dressings, lotions, emulsions and dusting powders. As a rule, ointments are tolerated poorly during the acute stage. Baths of cornstarch or oatmeal are serviceable, particularly for widespread eruptions. Antihistaminic ointments and creams have been disappointing and I have abandoned their use in topical management of urticaria.

Representative Prescription

℞

Menthol (0.25–0.5%)	0.3–0.6
Phenol (0.5%)	0.6
Chloral hydrate (3.0%)	3.6
Calamine lotion q.s. ad	120.0
Misce et fiat	
Signa: Paint on lesions with brush every 2 or 3 hours	

(Fred Wise)

See Formulary ℞ 10 with 1 per cent phenol, for antipruritic at any stage; ..., antipruritic and for local discomfort; 11, 57, for acute, subacute and chronic stages; 111, 112, as sedative in subacute stage; 113, antacid, laxative, in acute, subacute and chronic stages; 114, for urticaria following digestive disturbance.

Papular Urticaria

(Urticaria Papulosa, Lichen Urticatus, Prurigo Simplex, Strophulus)

Papular urticaria is an acute pruritic eruption characterized by the appearance of lichenoid papules, probably due to hypersensitization and generally occurring upon the exposed parts of the body. Some dermatologists distinguish between urticaria papulosa (an "acute pruritic" dermatosis) and lichen urticatus (frequently regarded as a chronic papular pruritic

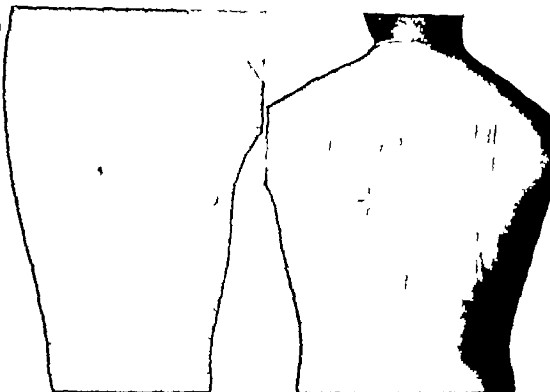


Fig 30 (left).—Urticaria in a girl 13 years of age Note raised edematous wheals surrounded by a zone of erythema.

Fig 31 (right) —Dermographism in a boy 15½ years of age. Elevated linear lesions are the result of drawing a tongue depressor across the back with gentle pressure. They remained for two hours, accompanied by itching of the trunk when they were at their height, and then gradually faded out.

Dermatitis herpetiformis is rare in children. The condition is very pruritic, very chronic characterized by scars, pigmentation, vesicles and bullae but there are no wheals as in urticaria In *lichen planus* the lesions are violaceous and in form the polygonal papule is the typical lesion. While the site of distribution may be the trunk the anterior aspects of the wrists the upper and lower extremities usually are also affected. Again there are no wheals as in urticaria. *Scabies* sometimes provokes urticarial lesions. But other members of the family are also affected and the distribution of the lesions is different from urticaria The finding of the burrow settles the diagnosis In *prurigo* the lesions are distributed mostly on the extensor surfaces of the arms and legs, and the wheal is not evanescent as in urticaria. *Erythema multiforme* is sometimes difficult to differentiate from urticaria, for the mucous membranes of the mouth may be involved The lesions are polymorphous, last longer than those in urticaria and are not pruritic. *Insect bites* are not common on the covered parts of the body A central hemorrhagic punctum may be found early and may last a day or two.

Complications and Prognosis.—There are no complications. Rare types are accompanied by pigmentation or hyperpigmentation which gradually fades. *Acute* urticaria has a self limited course. The prognosis is good. In *chronic* hives, the prognosis depends on finding the cause of the disturbance and eliminating it, if possible. When food allergens are the responsible factor the elimination of the offending foods and the substitution of nonallergenic foods will generally result in improvement.

Prophylaxis.—Prevention consists essentially in avoiding foods and agents known definitely to cause the individual s urticaria. Some foods, such as strawberries, may be eaten stewed instead of raw Desensitization (or better hypo-

infection may be elicited in scabies, whereas in lichen urticatus, more than one child is rarely affected. The finding of the acarus settles the diagnosis of scabies, and scabeticides cure the itch, but only temporarily in lichen urticatus. *Varicella* may be confused with lichen urticatus when the lesions are vesicular. However varicella lesions are polymorphous. In lichen urticatus the lesions are papular or papulovesicular. Varicella lesions are seen chiefly on the trunk (the covered areas), the mucous membrane of the mouth and upon the scalp, areas not involved in lichen urticatus. In difficult cases history of exposure to varicella may be helpful in differentiation. *Pediculosis capitis and corporis* may produce papular lesions and pyoderma upon the face and neck in the former and upon the trunk. Diagnosis rests upon identifying the pediculus and its ova. *Pyoderma* is frequently seen upon the extremities as a complication of lichen urticatus. It responds promptly to debridement with soap and water followed by the use of antibiotic topical remedies or bactericides. In *urticaria*, the typical edematous urticarial lesions are transient and, although seen anywhere on the body, they occur chiefly upon the trunk. There are no residual papules and, although the lesions are pruritic, they are seldom traumatized, excoriated or impetiginized. In *prurigo* the lesions have been present for at least two years. The individual papules are hard and excoriated, and there are an associated lichenification from scratching and adenopathy.

Complications and Prognosis.—Secondary infection from scratching (Fig. 33 *B*) is not rare.



Fig. 33.—Papular urticaria. A, caused by flea bites, with typical papules on face, B, with secondary infection due to scratching. (*B* courtesy of Dr Meyer L. Niedelman.)

eruption) For our purposes, these two terms will be used synonymously In contradistinction to prurigo of Hebra which is very chronic and very pruritic.

Etiology—*Recent investigations suggest that* urticaria papulosa is a hypersensitivity reaction to the bites of insects, particularly the common dog flea (Ctenocephalides canis) or cat flea (Ctenocephalides felis) and less often the

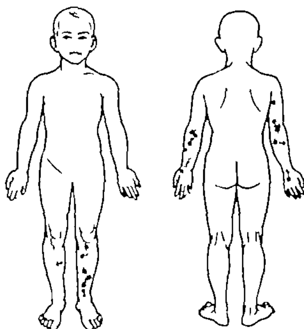


Fig 32.—Papular urticaria. Typical sites and distribution Occasionally the forehead and trunk may be affected.

bed bug (Cimex lectularius) and the human flea (*Pulex irritans*) *Evidence favoring this exogenous* source includes acknowledged exposure of the child to the common dog or cat flea, prevalence during the summer more common appearance in the lower social and economic strata and disappearance either on hospitalization or after the use of insecticides. Further skin test*ing with flea antigen causes a positive reaction* in a large percentage of instances. In a small percentage of instances, endogenous causes may operate For example, fresh fruits in season and raw vegetables may be important. However skin testing to food allergens is often worthless. It is my conviction that a third type of urticaria exists, the etiology of which is unknown

The condition is most common between the ages of 2 and 5 years. *It is definitely more com*mon in the spring and early fall and winter but careful inquiry often discloses that patients have had lichen *urticatus previously during the hot* season

Clinical Picture—The primary lesion is a small pruritic papule, usually appearing in crops upon exposed surfaces of the arms and legs, face and neck (*Figs. 32, 33*) *The trunk is usually free of lesions, as are also the genital, perianal and axillary regions this is a point of di*agnostic importance in differentiating lichen urticatus from scabies The mucous membranes are rarely involved The lesions may be few less than a dozen in mild cases or cover the ex*tensor surfaces of the arms and legs in the more* severe cases. Three types of lesions may be seen, *all forms* often appearing at the same time The wheal at times poorly defined, surrounded by a small zone of erythema in the center of which is a small papule, is among the earliest (urticaria papulosa) Or there may be prominent, thick*ened, centrally located shiny papules* with perhaps a slightly erythematous flare surrounding them (*lichen* urticatus) Too the central nodule or papule may be capped by a vesicle (strophulus vesiculosis) causing frequent confusion with scabies, particularly in infants. Upon palpation the papules are hard and firm They may persist *for weeks or months An outstanding* feature of lichen urticatus is the severe pruritus which leads to trauma *from* scratching and even secondary infection.

Diagnosis.—Discrete wheal-like (urticarial) or papular lesions generally appear in crops, disappear in a few days or weeks and are fol*lowed by a fresh outbreak.* The lesions, extremely pruritic are distributed mostly upon *the extensor surfaces of the arms and legs* and upon the forehead and neck

Differential Diagnosis.—The condition most commonly confused with papular urticaria is scabies It must also be differentiated from varicella pediculosis corporis and pediculosis capitis, pyoderma urticaria and prurigo.

The lesions of scabies occur upon the anterior axillary folds, the elbows, the anterior aspects of the wri ts, the palms and soles the webs of the fingers, the external genitalia the intercrural folds and upon the abdomen sites uninvolved in papular urticaria. A history of family

infection may be elicited in scabies, whereas in lichen urticatus, more than one child is rarely affected. The finding of the acarus settles the diagnosis of scabies, and scabieticides cure the itch, but only temporarily in lichen urticatus. *Varicella* may be confused with lichen urticatus when the lesions are vesicular However varicella lesions are polymorphous. I lichen urticatus the lesions are papular or papulovesicular Varicella lesions are seen chiefly on the trunk (the covered areas) the mucous membrane of the mouth and upon the scalp areas not involved in lichen urticatus. In difficult cases history of exposure to varicella may be helpful in differentiation. *Pediculosis capitis and corporis* may produce papular lesions and pyoderma upon the face and neck in the former and upon the trunk. Diagnosis rests upon identifying the pediculus and its ova. *Pyoderma* is frequently seen upon the extremities as a complication of lichen urticatus. It responds promptly to debridement with soap and water followed by the use of antibiotic topical remedies or bactericides. In *urticaria*, the typical edematous urticarial lesions are transient and, although seen anywhere on the body they occur chiefly upon the trunk. There are no residual papules and, although the lesions are pruritic, they are seldom traumatized, excoriated or impetiginized. In *prurigo*, the lesions have been present for at least two years. The individual papules are hard and excoriated, and there are an associated lichenification from scratching and adenopathy

Complications and Prognosis.—Secondary infection from scratching (Fig. 33 *B*) is not rare.



Fig. 33.—Papular urticaria A, caused by flea bites, with typical papules on face B with secondary infection due to scratching (B courtesy of Dr Meyer L. Niedelman.)

Ecthymatous ulcers and lichenification may occur. The prognosis is good provided the cause is found and removed, but recurrences are common.

Prophylaxis.—A careful history should be obtained from the parent regarding possible contact with fleas of dogs or cats, in the household or the immediate neighborhood from sand piles and boxes, coal piles cellar debris, upholstered furniture, pile rugs etc Such sources should be treated by 5 per cent DDT spray and pet animals infested with fleas should be sprayed or dusted with a powder containing DDT in talc. Five per cent DDT (dichloro-di-phenyl-trichlorethane) in Flit should be used daily in the household with particular attention to the baseboards, cellar bed frames and upholstered furniture and under cushions and rugs. DDT powder should be used wherever the spray cannot be used. Pets must be dusted and the child should be dusted lightly with the special powder and his bed clothes and mattress similarly treated.

When endogenous sources are discovered the particular allergenic foods should be eliminated from the diet. The allergenic properties of many raw fruits and vegetables can be destroyed by cooking or stewing

Therapy—Metrazol solution (10 per cent) gives excellent results. The dosage is as follows For patients under 2 years of age, 5 to 10 drops with any fruit juice every three hours (not more than four doses per day) For patients over 2 years of age 10 to 20 drops every three hours (not more than four doses per day) The remedy is administered for five days and is then followed by a rest period for two days when the doses as indicated above may be repeated. Itching disappears rapidly after the first few days of administration Involution of the lesions follows.

Constipation should be corrected with mild laxatives Soothing baths with starch or oatmeal are often needed to allay the itching and local discomfort. Topically mildly astringent and antipruritic lotions are often necessary Sulfur baths, wet dressings and ointments or creams are serviceable. Sedation, which is often necessary may be in the form of barbiturates, bromides or chloral hydrate.

The following prescription illustrates the use of precipitated sulfur in treating papular urticaria

℞
Precipitated sulfur (3%) 3.6
Petrolatum 120.0
Misce et fiat unguentum
Signa Apply two or more times daily

See Formulary ℞ 8 11 56 57 73 78, for antipruritics 106, for laxative, 108, for alterative in food allergy 109 110 111 for sedatives.

Angioedema
(Angioneurotic Edema)

This condition is a special form of urticaria characterized by an acute circumscribed edema of which the swellings appear quite suddenly and disappear as rapidly Recently there has been a tendency among allergists to drop the term angioneurotic edema and replace it by the term angioedema." Like urticaria many agents, both exogenous and endogenous, may be responsible. Sensitization to certain foods plays a role particularly eggs, strawberries, smoked fish shellfish and nuts are frequent offenders. Serum sickness, drugs and bacteria are also causative. Frequently a familial factor may be elicited.

Angioneurotic edema differs from urticaria in that it affects the looser tissues of the skin, such as the face, eyes, lids, lips (Fig. 34) and external genitalia, and larger areas are involved. There is a greater tendency for it to affect the mucous membranes, particularly of the glottis, with resulting asphyxia and death. Involvement of the gastrointestinal mucosa may produce symptoms simulating acute appendicitis. Upon pressure, the swelling is usually found to be firm and quite tender Pruritus is generally less severe than in urticaria.

Diagnosis is comparatively simple. A localized swelling of a firm consistency and tender appearing quite suddenly over the hands, ankles, eyelids, external genitalia is usually angioneurotic edema. It must be differentiated from localized circulatory disturbances (due to heart failure) and from scleroderma. *Circulatory heart failure*—the dermal effects differ in that edema is fairly persistent. In *scleroderma* the skin is quite hard and hidebound also the con-

dition is quite chronic, often circumscribed.

Milder cases respond favorably but severe cases involving the glottis may require intubation to prevent asphyxia.

Treatment.—To relieve the distress of asphyxia, Epinephrine Injection U.S.P (Adrenalin) should be used promptly An initial dose of 0.3 cc. is given subcutaneously and repeated at frequent intervals if necessary The injection may be followed by 25 mg. of ephedrine sulfate in tablet or capsule every four hours, depend-

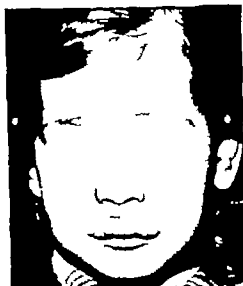


Fig. 34.—Angioedema in girl 3½ years of age. Swelling f upper lip occurred whenever a particular brand f syrup was served the child. Hives also occurred on the trunk.

ing on the child's age. Another effective preparation is the combination of ephedrine sulfate and Phenobarbital Capsules N.F each capsule containing .5 mg. of ephedrine sulfate and 30 mg. of phenobarbital Locally ice-cold wet dressings are serviceable. Antiphlogistic treatment as outlined for urticaria may be employed. For severe, acute cases corticotropin and the corticosteroids may be imperative.

Urticaria Pigmentosa
(Xanthelasmoidea)

Urticaria pigmentosa is a chronic disease characterized by pigmented macules, nodules or maculopapules. Although not common, the condition is by no means rare. It is of particular interest because it generally begins in early infancy

The eruption exists in three well-defined types (1) macular (Fig. 35 *A*) (2) nodular (3) maculonodular or mixed. Bullous lesions (Fig. 35 *B*) may occur with any of these types but are seen only occasionally at birth or soon after The nodular type occurs almost entirely in infancy and childhood, whereas in older people the macular variety is the most common.

Etiology.—The exact cause is unknown. Some investigators feel that the condition is a congenital disorder Urticaria pigmentosa is characterized by an overproduction of mast cells in the basal cell layer of the epidermis and in the upper corium. Such factors as vaccination, varicella, other sorts of urticarial lesions and emotional stimuli, acting upon a skin which is fundamentally abnormal are believed possibly to be responsible for urticaria pigmentosa. Blonds are more susceptible than brunets, and males more than females.

Clinical Picture.—At first the lesions may resemble ordinary urticaria, being characterized by crops of wheals, usually appearing on the trunk and soon disappearing only to reappear as brown or buff pigmented areas, and assuming the character of the three types already described. Three clinical stages can be distinguished. The initial numerous wheals appear in various crops, remain for a short time retrogress and leave either brown spots or papules. This period lasts few days to a year Recrudescence follows in the sites of the spots and papules with no real increase in the number of wheals. This period is of two to five years duration. Finally there is the period of retrogression, with the crops becoming fewer and ending with restitutio ad integrum in four to six years or more. On the other hand, the pigmented areas themselves may persist for 50 years. There may be dozen lesions or a hundred or more, varying from pinhead size to that of a cherry and being discrete or confluent.

Eruptions usually appear before the age of six months, usually in the third or fourth month of life. The trunk and extremities are the usual sites; the eruption seldom is seen on the face,

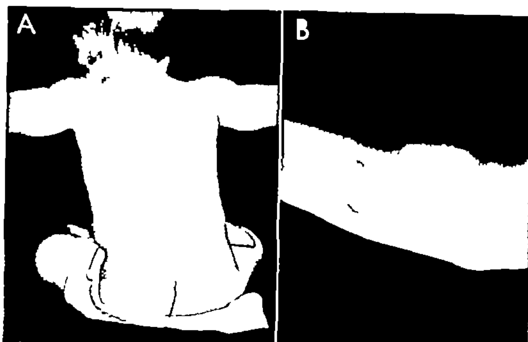


Fig 35 —Urticaria pigmentosa A, in 3½ month old infant Some of the numerous discrete oval or rounded yellowish brown lesions are definitely urticated on the trunk and on upper and lower extremities. Biopsy showed presence of mast cells. B bulla in 4-month-old girl in whom lesions were first noticed at 3 weeks of age as red spots like bruise marks on the abdomen They then appeared on arms, forearms and trunk. (*B* courtesy of Dr Joseph Grossman)

palms soles or mucous membranes. An interesting feature is the so-called "Darier's sign when the lesions are stroked or vigorously rubbed the skin will respond in the form of reddened wheals (urtication) By this sign alone a diagnosis of urticaria pigmentosa may be reached. Dermographism may or may not be present, so contributes little to diagnosis. Itching is also variable.

Diagnosis.—The onset during infancy of yellowish brownish or buff-colored pigmented macules or nodules, or both on the trunk and extremities, the presence of Darier's sign and the persistency of the lesions readily establish the diagnosis.

Urticaria pigmentosa should be *differentiated* from urticaria xanthoma and fixed drug eruptions. *Urticaria* generally appears at a later age than does urticaria pigmentosa and its wheals are evanescent and not accompanied by pigmentation The ordinary type of *xanthomas* are yellowish, chamois color and thick. The lesions of urticaria pigmentosa are yellowish brownish or buff-color some of which are evanescent and appear in particular regions, such as the eyelids and elbows The age of onset is a deciding factor in differentiation with xanthoma lesions appearing much later Darier's sign is not present with xanthomas Even so a biopsy examination may be necessary to settle diagnosis in difficult cases. In *fixed drug eruption* (antipyrine phenophthalein etc.,) the lesion is usually single, although possibly multiple. The fixed drug eruption remains localized at a particular site on the skin. A history of drug ingestion or the administration of a certain remedy may assist diagnosis.

Complications Prognosis and Treatment—Pigmented scars follow occasionally particularly when the lesions are of the nodular type. Adenopathy is seen in long-standing cases. Atrophic macules are seen occasionally

The condition usually disappears at puberty but pigmented macules may persist throughout life. There is no known treatment or cure Roentgen therapy has caused the lesions to disappear temporarily Antipruritic lotions, creams and ointments may be tried when itching is

present. The antihistamine drugs have failed to help in our experience.

Erythema Multiforme Exudativum (Hebra)
(Polymorphic Erythema)

Erythema multiforme exudativum is an acute inflammatory disease of the skin and mucous membranes of relatively short duration. The skin lesions are characterized by red to reddish-purple macules, papules, vesicles and nodules, less frequently by bullae purpura, urticaria and angioneurotic edema. Lesions also occur either singly or in various combinations on the mucous membranes at the same time as the skin rash, but seldom do they occur in proximate areas.

In his original description Hebra undoubtedly referred to an acute eruption of polymorphous nature exudative and characterized by bright or dark red lesions symmetrically situated upon the face, neck, forearms, legs and dorsa of the hands and feet. The mucous membranes were occasionally involved. Further his clinical ... consisted of macules, papules and urticarial, bullous and hemorrhagic lesions.

Darier distinguished three types of erythema multiforme (1) erythematopapular (2) bullous and (3) nodular However American and English dermatologists usually divide the disease into two types (1) maculopapular (erythematopapular) (2) vesicobullous.

Etiology.—No one specific etiologic agent is responsible for erythema multiforme. Alimentary intoxication due to foods, bacteria, virus and drugs, as well as infections, have been incriminated. Erythema multiforme is often seen in children with rheumatic fever Many investigators believe various agents may act as allergens. The idiopathic type ecurring periodically in the spring or fall is supposed to be due to some focus of infection, such as diseased tonsils abscessed teeth and infected sinus. Many drugs, especially those of the coal tar series, the iodides and particularly the sulfonamides are frequent offenders The injection of sera, such as diphtheria antitoxin and tetanus antitoxin, has been known to be followed by erythema multiforme (Yet erythema multiforme may be epidemic as has been reported in some areas in Turkey and in the United States.)

Clinical Picture.—The term erythema multiforme while open to objection is probably a good one since it describes the color of the lesions and the polymorphous character of the rash (Fig. 36) The symptomatology is best described under the headings of the two types erythematopapular and vesicobullous. Both variants may be encountered in the same patient either simultaneously or in different crops, or in later recurrences of the infection.

Erythematopapular type.—The dorsa of the hands are the f vorite sites for this type, which is common in children. This area is generally the first involved. The primary lesion is an erythematous macule that rapidly becomes papular When the disease is moderately severe, urticarial lesions follow The center of the papule is violaceous, as the lesion enlarges peripherally it becomes lightly depressed in the center with a distinct reddish raised margin. Typically the lesion extends upward upon the extensor surfaces of both forearms, arms and sides of the neck and face to the forehead. This order of events nd distribution are considered quite characteristic: In fact, they become of diagnostic importance when the lesions are poorly defined and atypical. Extension from the dorsa of the feet and extensor surfaces of the legs and knees to the thighs is also characteristic. Occasionally lesions are seen upon the palms, soles and trunk. The mucous membranes of the mouth and lips are less often involved than in the vesiculobullous variety nd there are no constitutional symptoms. There is no pruritus.

Vesiculobullous type.—This represents an advanced stage, viewed histopathologically (Fig. 37) The Stevens-Johnson syndrome belongs in this category Essentially the vesiculobullous type is a severe form of the disease in which the corium and epidermis are edematous A small vesicle or bulla is found superimposed upon a papule which may be demonstrated microscopically between the corium and epidermis. The mucous membranes of the mouth, lips, pharynx and tongue may be involved, often causing considerable annoyance on eating and swallowing. *Hyperpigmentation* following involution of the lesions may persist for several months. The symptoms, which are variable,

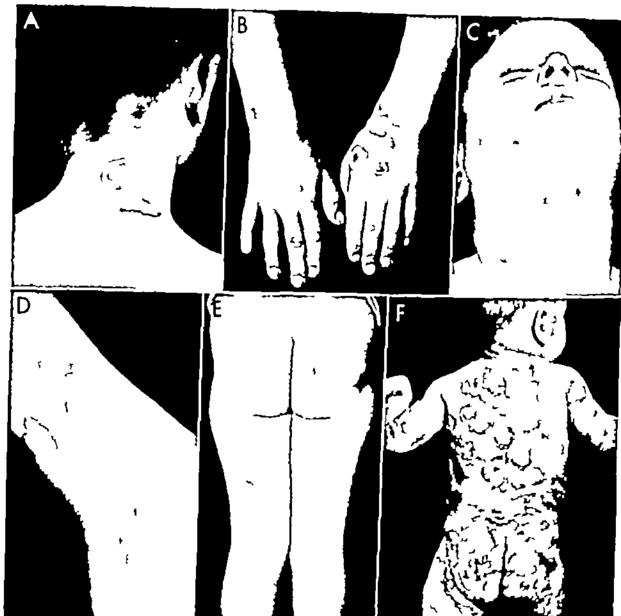


Fig. 36 —Erythema multiforme. A, and B the bullosum type in a 10½-year-old boy Note the grouped vesicles surrounded by a hyperemic ring. C, and D the bullosum type in a freckled 9-year-old boy Note the erythema, vesicles and crusts on the skin of the chin neck and the polycyclic pattern on the inner aspect of the arm and trunk. Iris lesions appeared on the palms, groins and buttocks. The lesions appeared abruptly in 24 hours after eating chocolate E, the papular type in a 10-year-old girl. Many of the lesions appeared abruptly one day after the taking of elixir terpin hydrate with codeine for a cough and some of them displayed a reddish blue discoloration. Photograph was taken a week after appearance of rash The urticarial raised papules appeared on the upper and lower extremities and were also seen on the anterior axillary folds. F the bullosum type in a one-year-old Note the vesiculobullous lesions arranged in the form of circles surrounding bullous or crusted centers. Many lesions were characterized by varicolored concentric rings (erythema iris) (F courtesy of Dr A. H Bleier)

may include a sensation of burning, itching and joint pains. There may be local discomfort from the swelling of the affected parts. Headache, prostration, gastrointestinal derangement, such as vomiting and diarrhea, and slight elevation of temperature are not uncommon in older children.

Diagnosis.—Typically single papules enlarge after a day and become depressed in a livid center with a bright red (cinnabar) margin. Or the papule may be characterized by a circle should call for further study to determine the presence of rheumatic fever) (7) a seasonal incidence frequency in the spring and fall, (8) tendency to seasonal recurrence, especially in the young, although no age is exempt.

Differential Diagnosis.—Erythema multiforme must be differentiated from urticaria, drug rashes, pityriasis rosea, dermatitis herpetiformis, pemphigus, purpuras and toxic erythema. The bullous type may be confused with diphtheria, varicella, vaccinia and brucellosis.



Fig. 17.—Erythema multiforme. Histopathologic section shows intraepidermal bulla, the result of edema in the upper corium and in the rete malpighii.

of small vesicles either upon the lesion itself or at its periphery sometimes it is hemorrhagic. The distribution of the lesions is usually typical. Joint pains are commonly complained of by older children. Helpful diagnostic points include the following (1) The morphologic characteristics of the skin lesions; (2) the bright red or purplish color of the lesions (thereby often mistaken for bruise marks) (3) their urticaria-like character (4) the symmetrical distribution of the lesions and their predilection for certain regions (5) residual pigmentation following the involution (6) constitutional disturbances, such as malaise and fever in a large proportion of patients (Erythema multiforme in children

In *urticaria* the center of the lesion is characterized by a white or blanched area. The wheals are small and closely packed, irregularly distributed and itching may be severe. In *drug eruptions*, since the sulfonamides, the iodides, the bromides quinine, salicylic acid derivatives and coal tar products are frequent offenders, the most important point in differentiation is a history of drug ingestion. The annular type of erythema multiforme may be confused with *pityriasis rosea*. However in the latter the initial lesion, resembling ringworm, precedes the generalized eruption by week or ten days, after which diagnosis is relatively simple for the lesions follow the lines of cleavage of the ribs

and are not urticarial. The individual lesion in pityriasis rosea is oval and presents a fine cigarette-paper like scale which after a short period breaks in the center while the edges remain attached to the periphery The mucous membranes are not often involved. When the lesions of erythema multiforme are vesicular or bullous, they may be confused with *dermatitis herpetiformis* and *pemphigus* but these diseases are seldom encountered in children. However biopsy may be necessary for absolute diagnosis. The soft friable membrane on the tonsils, conjunctiva or mucous membrane of the genitalia and nose may be difficult to differentiate from *diphtheria.* However the diphtheritic membrane is closely adherent to the mucous membrane is removed with difficulty and when removed leaves a raw bleeding surface. The easily detached pseudomembrane of erythema multiforme is more extensive, involving also the buccal mucous membrane, the lips and the floor of the mouth. In diphtheria, constitutional reactions are mild whereas in erythema multiforme fever is present. Discovery of the Klebs-Loeffler bacillus upon culture will settle the diagnosis of diphtheria In *varicella* the skin lesions are polymorphous, consisting of macules, papules, vesicles, pustules and crusts in varying stages, seen at the same time and presenting no orderly arrangement Bullous lesions are uncommon in varicella and pruritus is characteristic. While the mucous membranes of the mouth are affected in varicella, a necrotic ulcerating pseudomembrane is seldom seen in erythema multiforme bullosum. Constitutional symptoms when present in varicella are less severe than in erythema multiforme. A history of exposure may be helpful in determining that the disorder is chickenpox *Generalized vaccinia* appears usually within ten days to two weeks *following smallpox vaccination* Successive stages of development appear in orderly sequence macules, papules, vesicles, pustules and crusts. There are no erythematous polymorphous lesions but one stage is seen at a *given time* and the lesions are generalized over the skin The mucous membranes are not involved. A history of exposure to variola and the character of the rash serves to *differentiate smallpox* from erythema multiforme. A satisfactory vaccination scar may be of considerable help in ruling out smallpox.

Prognosis.—Erythema multiforme runs a self-limited course, generally of from two to three weeks duration, although occasionally it lasts five weeks and rarely two months. The prognosis depends upon the severity of the constitutional symptoms. *It is ordinarily good in moderately mild instances.* At the Willard-Parker Hospital New York, Fletcher and Harris found five fatalities in 28 cases over a 12½ year period and Hebra referred to the benign character of the disease, although he had seen one patient in whom the disease was followed by pneumonia.

Complications.—*Pneumonia is a common* complication. Others include pyoderma, diarrhea, sinusitis and uremia. Recurrences and relapses *are common in the vesiculobullous type.*

Treatment—During the acute attack the diet should be light and one that is easily assimilated Rest in bed should be the rule if fever is present. Warm baths are comforting. Salicylates *when not a cause, may be given* as acetylsalicylic acid or sodium salicylate for joint pains. The following prescription illustrates such therapy

℞
Sodium salicylate 8.0
Syrup orange 120 0
Misce et fiat
Signa. *One teaspoonful in orange juice every four hours*
Indication Child five years old

Calcium chloride in doses of ⅓ to ½ teaspoonful three times daily added to milk, is a *popular remedy* with *many* European dermatologists. For infections caused by streptococcus and staphylococcus, procaine penicillin in oil or in aqueous solution (300 000 units intramuscularly) should be administered daily until *the infection has been controlled.*

For topical therapy wet dressings of aluminum acetate solution or simple shake lotions are often helpful. Starch baths relieve *the tenseness* and burning sensation of the skin a frequent complaint of older children. A mouth wash of a mild antiseptic solution such as Antiseptic Solution N F one teaspoonful *to a glass of warm water is helpful for the discomfort* in the mouth.

Stevens Johnson Syndrome

The Stevens-Johnson syndrome is a triad of skin, eye and mucous membrane lesions (erythema multiforme) associated with a marked general toxicity It is frequently referred to as severe erythema multiforme, and sometimes as erythema multiforme of the pluriorificial major or malignant febrile type.

As in erythema multiforme exudativum, the syndrome occurs most frequently during spring *and fall* and *usually in young males*. The causative superimposed organism is staphylococcus aureus and occasionally staphylococcus with streptococcus.

Clinical Picture.—The outstanding feature is the severe conjunctivitis (Fig. 38, *A*) which is always present. Onset is abrupt, with fever and signs of general toxicity malaise and headache. There may be nausea and vomiting. At the same time, or within three days, erythema multiforme lesions (papules, nodules, and sometimes urticarial plaques) appear upon the arms and legs and sometimes upon the face and trunk (Fig. 38, *B*) Occasionally vesicles and pustules also are seen. In most cases the lesions are exudative. At this time, *or within a day or two*, the patient complains of sores in the mouth, the lips and buccal mucosa contain vesicles, many of which, having ruptured, appear as ulcers covered by a membrane. Then follows a severe stomatitis which makes it impossible for the patient to take nourishment. In extreme cases the entire oral mucous membrane may be involved. Many of the lesions of the lips become dry and crusted *(Fig. 38, C) Other mucous membranes* may also share in the process, such as the meatus of the penis and the vaginal mucosa. The mucous membrane of the eyes becomes intensely red, swollen and characterized by a purulent discharge. Close inspection of the conjunctiva will disclose numerous small vesicles.

The child looks toxic, seems extremely ill is prostrated and refuses nourishment. In moder*ately severe and quite severe cases there are* edema of the eyelids and photophobia.

Complications and Prognosis.—Formerly the ocular involvement was followed by severe



Fig. 38.—Stevens-Johnson syndrome. A, in a child of 13 years. Note involvement of conjunctival mucous membranes B in 22-month-old infant. Note that eyelids and lips are covered with bloody crusts. The generalized hemorrhagic skin lesions also were covered with crusts. C, in child 12 years of age. Note the hemorrhagic areas of the skin and involvement of the conjunctiva and mucous membranes of the mouth (*A* and *C* courtesy of Dr Robert L. Brent, *B* by permission from Ritter J A., et al., J Pediat 33 19-223 Aug. 1948)

and are not urticarial. The individual lesion in pityriasis rosea is oval and presents a fine cigarette-paper like scale, which after a short period breaks in the center while the edges remain attached to the periphery The mucous membranes are not often involved. When the lesions of erythema multiforme are vesicular or bullous, they may be confused with *dermatitis herpetiformis* and *pemphigus* but these diseases are seldom encountered in children However biopsy may be necessary for absolute diagnosis. The soft friable membrane on the tonsils conjunctiva or mucous membrane of the genitalia and nose may be difficult to differentiate from *diphtheria* However the diphtheritic membrane is closely adherent to the mucous membrane, is removed with difficulty and when removed leaves a raw bleeding surface. The easily detached pseudomembrane of erythema multiforme is more extensive involving also the buccal mucous membrane the lips and the floor of the mouth. In diphtheria, constitutional reactions are mild, whereas in erythema multiforme fever is present. Discovery of the Klebs-Loeffler bacillus upon culture will settle the diagnosis of diphtheria. In *varicella* the skin lesions are polymorphous consisting of macules, papules, vesicles, pustules and crusts in varying stages seen at the same time and presenting no orderly arrangement. Bullous lesions are uncommon in varicella and pruritus is characteristic. While the mucous membranes of the mouth are affected in varicella, a necrotic ulcerating pseudomembrane is seldom seen in erythema multiforme bullosum Constitutional symptoms, when present, in varicella are less severe than in erythema multiforme. A history of exposure may be helpful in determining that the disorder is chickenpox *Generalized vaccinia* appears usually within ten days to two weeks following smallpox vaccination Successive stages of development appear in orderly sequence macules papules, vesicles, pustules and crusts. There are no erythematous polymorphous lesions but one stage is seen at a given time and the lesions are generalized over the skin. The mucous membranes are not involved. A history of exposure to variola and the character of the rash serves to differentiate *smallpox* from erythema multiforme. A satisfactory vaccination scar may be of considerable help in ruling out smallpox.

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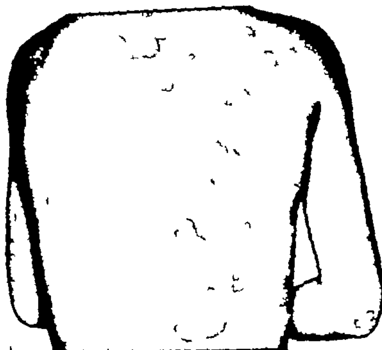


Fig. 39.—Erythema marginatum in child with rheumatic fever. The circinate macules were purplish red and nonpruritic. Other lesions follow an arciform pattern with clearing in the center and slightly elevated border. (By permission from Massell, B. F. Medical Clinics of North America, Philadelphia, W. B. Saunders Company September 1958.)

macules, papules and nodules may be seen, hence the terms erythema papulatum (erythema papulosum) or erythema tuberculosum (erythema tuberculatum). Often it is difficult to differentiate between the marginated and the annular types. In the former the edge of the lesion is raised, in the latter the lesions are entirely macular. However, lesions of both types may be seen at the same time. As a rule, the eruption lasts only a few days and disappears as rapidly as it comes on. But again, it may be prolonged for years and recurrences are not uncommon.

The areas of predilection are the trunk and the extremities, especially the dorsal surfaces of the hands. Rarely the buccal mucous membrane may be involved.

Diagnosis.—The sudden appearance on the trunk or extremities of smooth, circinate, nonpruritic, dusky-colored macules which rapidly clear in the center, leaving a raised border or else of papules which appear in crops and which usually disappear in the course of a few days, should lead one to suspect erythema marginatum. Signs of rheumatic fever may be disclosed by an examination of the heart and laboratory studies (blood sedimentation, blood count, etc.)

Serum rashes and drug rashes should be differentiated. A *serum rash* (sometimes caused by the injection of diphtheria antitoxin, tetanus antitoxin, etc.) may be of an urticarial, erythematous or morbilliform or scarlatiniform character and may resemble that of erythema multiforme. Usually the rash is accompanied by a constitutional reaction, elevation of temperature and adenopathy. The areas of predilection are the thighs and buttocks. Effusion of the joints may follow.

In *drug eruptions* the character of the eruption will depend on the particular drug. A history of the ingestion of a particular drug may

and permanently damaging results, including blindness and even perforation of the globe *Happily the sulfonamides* and antibiotics have notably curtailed serious eye complications par *ticularly when administered early in the course.* Prognosis depends essentially on the degree of involvement of the various *mucous mem* branes and the promptitude with which antibiotics and sulfonamides are administered In mild cases the eye will be cleared of the infec *tion in 5 to 9 days in* severe cases in 3 to 6 weeks

Prophylaxis.—Antibiotics and sulfonamides should be administered as soon as erythema multiforme bullosum is diagnosed in the hope of reducing the possible eye complications

Therapy.—Antibiotic therapy should be com menced immediately Procaine penicillin (aque ous suspension) 300 000 units, should be administered daily intramuscularly until the temperature has reached normal and the constitutional symptoms have disappeared. In addition, sulfadiazine, should be given, 2 Gm. *upon hospitalization and 1 Gm every four hours* thereafter daily per os. Both remedies should be *continued per os once or twice daily for one* week after the temperature is normal penicil lin in dose of 50 000 units and sulfadiazine in dose of 1 Gm

Every two hours the eyes should be cleansed with a saturated solution of boric acid followed by 5 per cent sulfathiazole penicillin or baci tracin ophthalmic ointment The mouth should be kept clean by frequent rinsings with Anti septic Solution N F (This preparation is best diluted with an equal amount of water for younger children) In *infants* and young chil dren essence of caroid may be applied by cot *ton applicator followed by a painting of the mu* cous membrane of the mouth and lips with a *one* per cent aqueous solution of gentian violet. Sedation should be ordered when necessary Chloral hydrate, 1–10 gr (0 065–0 6 Gm.) depending on the age, or phenobarbital soluble, ½ gr (0 032 Gm.) should be given by mouth every four hours Glucose and fluids should be given parenterally as indicated in severe cases. ACTH and cortisone are useful *in* treating Stevens Johnson syndrome characterized by le*sions on the skin* mucous membranes of the nose, mouth and pharynx and the conjunctivae and cornea *of the eye.*

ACTH is administered in 10 mg. doses every six hours for three days, then every eight hours for several days more. Adjunctive therapy includes topical application of cortisone in the eyes, tyrothricin eye drops and chloramphenicol.

Recently the use of Terracortril Suspension 5 cc. (a combination of cortone and terramycin in sterile mineral oil) has proved very useful in clearing up the eye manifestations. One drop is instilled into the af fected eye (or eyes) hourly for eight doses, then every two hours for the following day and one drop every three hours on the third day until the local manifesta tions have disappeared.

Erythema Marginatum

(Erythema Annulare, Erythema Gyratum, Erythema Circinatum)

Erythema marginatum is a form of erythema multiforme in which the lesions are character ized by a definitely elevated and well-defined marginal band, which is left behind from the erythematous patch Although there is some doubt as to the etiology most investigators regard erythema marginatum as strong evidence of the presence of active *rheumatic fever* Jones asserts that in his experience erythema *marginatum is by far the most significant mani*festation of rheumatic fever Indeed, he names *it as one of the major* criteria for diagnosis of that ailment. Wallgren holds no doubt that erythema annulare occurs in connection with rheumatic fever more frequently in severe than in mild cases. However Keil's attitude is not declarative as to whether erythema mar ginatum is really a specific manifestation of rheumatic fever He mentions drug and serum eruptions also as causative possibilities al*though he agrees that in childhood the rash may* be regarded as almost certain evidence of acute *rheumatic fever*

Clinical Picture—At first the lesions appear as dusky (purplish red) smooth, nonpruritic cir cinate macules (Fig. 39) Sometimes the lesions follow a serpiginous or a scalloped pattern. They often appear in crops in the course of a few hours. As the lesions develop further they clear *in the center leaving a slightly elevated* border Macules in close proximity may coalesce to form polycyclic patterns Again instead of

which generally precedes the eruption, is present during the entire acute stage. Children complain of pain in the joints, which are frequently swollen and tender and of muscular pains and aches, malaise and gastrointestinal disturbances.

Diagnosis.—Painful nodes of a red to reddish-blue color usually indicate erythema nodosum when they are symmetrically localized over both tibia and upon the dorsum of the feet, vary in size from a cherry to a plum (1.5 cm.) and are painful and tender and hot to the touch. There is generally a febrile reaction. Arthritic pain is usual, but may be absent.

Erythema nodosum should be differentiated from *contusions* and *erythema induratum*. In the former a history of injury is usually obtained, the lesions are less numerous and are generally asymmetrical and flat. In the latter the lesions, which are chronic, are generally found upon the dorsal aspects of the legs and the histopathologic picture is characteristic of tuberculosis.

The condition is self-limited. The lesions, involuting in from 2 to 5 weeks, seldom recur

Treatment.—Systemic.—The child should be put on a light diet. Foci of infection should be looked for and when found, cleared. Constipation should be corrected by means of a mild laxative such as milk of magnesia (4-16 cc. once or more daily) Rest in bed should be insisted upon during the febrile period and while the lesions are acutely inflamed. Salicylates should be prescribed for their analgesic effect. Acetylsalicylic acid may be ordered in doses of 0 065 Gm. for each year of the child's age (a maximum of 0.32 Gm. as a single dose for child 5 years or older every four hours) Sodium salicylate may be prescribed instead of aspirin. Antibiotic therapy is serviceable in treating erythema nodosum attributable to bacterial infections.

Considerable interest has been aroused from the use of cortisone or corticotropin (ACTH) by independent investigators. The rationale governing the use of these hormones lies in the fact that erythema nodosum is due to hypersensitivity which is known to respond to these agents Good results have been reported from cortisone per os after trial with penicillin and other remedies proved unsuccessful. Schmalzson's dosage schedule of cortisone given by mouth to a 10-year-old girl is as follows first day 25 mg. cortisone (total 75 mg. daily) given at six-hour intervals, second and third day 25 mg. cortisone twice daily fourth to seventh day inclusive, 25 mg. cortisone daily Relief from pain occurred promptly after the third dose of cortisone: all pain and tenderness cleared after 48 hours and the nodules disappeared. Upon the discontinuance of treatment, there was no recurrence of the lesions.

Local.—The lower extremities should be elevated during the acute stage Either ice-cold wet dressings or continuous compresses (in some instances hot compresses are more comforting) or Burow's solution (aluminum acetate solution) 1 10 or 1 20 are serviceable. At times diluted alcohol (70 per cent) applied as wet dressings is comforting. Following the acute stage, a 5 per cent ichthammol ointment applied several times daily for one week hastens involution of the lesions. The lesions should be bandaged tightly to aid absorption of their exudate.

See Formulary ℞ 30 and 93 for subacute stage.

Leiner's Disease
(Erythroderma Desquamativa)

This condition among nursing infants was first described by Carl Leiner in 1908. It is an intense, macular erythema covering the skin of the entire body and accompanied by profuse scaling.

It is a disease of early life, commonly observed among infants between the first and second months, although the condition has been seen in infants older than 2 months. Moro believed that the condition was caused by the lack of a special "H" vitamin in combination with a relatively high intake of fat in the breast milk, further that breast milk contained less of the vitamin or the minimal substance than did cow's milk, hence the greater frequency of the illness among breast-fed infants. Leiner believed that the disease was probably due to some autotoxic substance that originated in the intestinal tract and that was transmitted to the infant through breast milk.

be extremely helpful in differential diagnosis.

Complications.—As has already been mentioned, most investigators regard erythema marginatum as indicative of rheumatic fever. The association of erythema with acute nephritis is rare. Scarring of the lesions is also rare, and, when it occurs, it is due to a staphylococcic infection.

Prognosis and Treatment.—Some authorities regard erythema marginatum of favorable prognostic significance. On the other hand, Keil concluded that involvement of the heart practically always accompanies the cutaneous manifestation of rheumatic fever. Erythema marginatum may persist when all other signs of rheumatic activity have subsided and long after the sedimentation rate has returned to a normal value.

The lesions are self-limited. Antiphlogistic topical therapy is helpful.

Erythema Nodosum
(Dermatitis Contusiformis)

Erythema nodosum is a disease characterized by transitory nodules in the skin, usually of the lower extremities, frequently associated with fever and with or without migratory arthritis.

Etiology.—The disease is an expression of hypersensitiveness to a chemical or to a toxic or bacterial agent. In brief, it is probably an erythema multiforme reaction—an allergic type of reaction to infection and to many drugs.

Formerly, children with erythema nodosum supposedly were tuberculous or had rheumatic fever. *We now know that the tubercle bacillus* and the streptococcus of rheumatic fever are but two of the many causes of erythema nodosum, others including streptococcic infections other than rheumatic fever, coccidioidomycosis, infectious exanthema (erythema nodosum frequently follows measles), leprosy, gonorrhea, syphilis, lymphogranuloma venereum, chancroid, sarcoidosis and drug sensitivity. Trichophytosis and intestinal parasites, too, have been incriminated. Among the drugs, the iodides, bromides, sulfonamides and antipyrine may cause erythema *nodosum like lesions.* Erythema nodosum *is most common* during the cold seasons.

Clinical Picture.—The lesions vary from a few to as many as 20 or more round or oval nodules symmetrically distributed over the extensor surfaces of both legs (tibia) (Fig. 40) and dorsa *of the feet,* occasionally upon the thighs and gluteal regions, and less rarely upon the *forearms. They may be grouped,* occur singly or appear in crops. The nodule may be as small as a pea or be as large as a cherry and even a hen's egg. At first the nodules are small and erythematous, resembling bruise marks. Later they become reddish to bluish red. When fully developed they are elevated above the skin surface. They may be quite firm or soft and fluctuant, extremely tender, hot to the touch and *painful.* The lesions, as a rule, appear suddenly, involute after a few weeks without breaking down and leave a bluish discoloration like that following a bruise. This discoloration, caused by interstitial hemorrhage, *fades* and disappears gradually. Fever

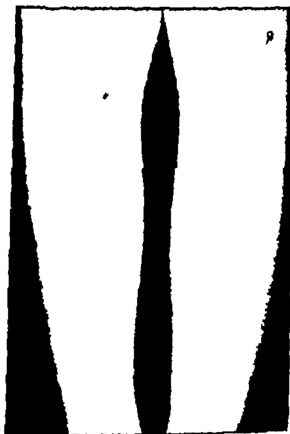


Fig. 40.—Erythema nodosum of 10 days' duration in a girl 6 years of age. Symmetrical nodular swellings on extensor surfaces of both legs were *reddish colored, extremely painful* and tender. The condition *followed* measles and was complicated by a discharging ear.

Furthermore, pruritus is invariably present in atopic dermatitis; it is minimal or absent in Leiner's disease. Atopic dermatitis is characterized by chronicity occurs in cycles, now better and again worse; Leiner's disease clears in a few weeks.

In *atopic erythroderma* there may be a family history of atopy severe pruritus and eosinophilia, but these features are absent in Leiner's disease. On the other hand, gastrointestinal derangement (diarrhea and secondary anemia) is frequently present in Leiner's disease, but is absent in atopic erythroderma.

In congenital ichthyosiforme erythroderma the lesions are found on the flexural surfaces of the upper and lower extremities, but this is not the case in Leiner's disease. Congenital ichthyosiforme erythroderma is present at birth while Leiner disease occurs at a later period.

Dermatitis exfoliativa neonatorum (Ritter's disease) appears earlier (at from 6 days to 1 month) than Leiner's disease (at from 1 to 2 months). Ritter's disease begins with a redness usually around the mouth, which then spreads over the entire body The hyperemia in Ritter's disease may be so intense as to cause the epidermis to become detached from the corium (epidermolysis, Nikolsky's sign) Other features of Ritter's disease that are absent in Leiner's disease are the large denuded areas causing the skin to resemble that of scalded child, the vesicles (bullae) pustules, with fissuring and crust formation at the mucous membrane outlets, and the presence of constitutional symptoms.

Dermatitis exfoliativa epidemica (Savill's disease) which is seen mostly in infants in the British Isles, is characterized by moderate pruritic, moist, eczematoid, papular and follicular eruption, involving chiefly the face and upper extremities. Constitutional symptoms are present, in direct contrast to Leiner's disease which, although characterized by generalized erythematous and desquamative condition covering the entire body with associated seborrheic dermatitis of the scalp is without constitutional symptoms.

Prognosis.—At one time mortality varied from 6 to 50 per cent, but with the advent of antibiotics it has been reduced to a minimum. The outlook is excellent if intercurrent infection is prevented. The condition clears in three to four weeks and does not recur

Treatment—A warm starch bath or Aveeno bath should be given daily in order to remove the greasy scales and debris that may accumulate, with particular attention directed to the folds of the skin. Removal of the greasy scales may be accomplished by means of cotton pledgets soaked in warm olive oil. I have found Burow's emulsion to be the best topical antiphlogistic remedy It may be applied to the skin of the entire body at three- or four-hour intervals. Antibiotic therapy is used to prevent intercurrent infection. Intravenous whole blood transfusions are indicated for the correction of the anemia.

See Formulary ℞ 69 antiphlogistic.

Drug Reactions
(Allergy to Drugs)

Drug idiosyncrasy may be defined as an abnormal quantitative response to drug and drug allergy as an abnormal qualitative response to a drug. The latter has no relationship to the normal physiologic reaction to a drug as in the case of urticaria produced by penicillin, for any drug or foreign serum may act as an allergen. In fact reactions have not infrequently been encountered from penicillin used topically as an ointment or cream, from aspirin *per os* and from serum used for immunization (e g., tetanus antitoxin) The drug or chemical employed may provoke a reaction *per se* or frequently however it is after its entering the body and combining with conjugated protein (hapten) that the untoward reactions follow

Glaser makes the interesting statement that more than one half (56 per cent) of allergic children may be expected to give some type of disagreeable reaction to drugs, compared with 6 per cent of non-allergic children. He based this statement on a study which revealed that 20 per cent of a group of allergic children gave allergic reactions to drugs as compared with 2.4 per cent of a non-allergic group, and that side reactions, or "minor drug allergies occurred in 36 per cent of the allergic children but in only 3.5 per cent of the non-allergic group.

Again, according to Glaser aspirin is the drug most commonly used in pediatric practice,

However unhappily for his theory not all his cases were found in breast fed infants Accordingly most dermatologists in this country are in agreement with the rationale of the Heidelberg school i e., that Leiner s disease is a *greatly intensified* seborrheic dermatitis.

Clinical Picture.—The disease occurs suddenly in an apparently healthy *infant, usually* between the ages of four weeks and two months. The first sign is an intense macular erythema which usually begins around the buttock but may occur elsewhere. However it soon covers the skin of the entire body so that the fiery red ness, as a rule, soon becomes generalized. In other instances the redness may be of a patchy distribution with normal skin occurring between the red plaques. In my experience, practically all patients have shown a seborrheic dermatitis of the scalp at the same time with evidence of seborrheic areas behind the ears, over the evbrows, at the root of the nose, on the lateral aspects of the nose and around the mouth. The redness is followed after a few days by a scaliness of the affected areas which may assume a fine, lamellated, branny desquamation (Fig. 41) while in other instances there is little if any scaliness *or the scaliness may be localized* and patchy The scales are easily separated from the skin. However the scalp shows the typical thickened yellowish scales and crusts ordinarily seen in cradle cap *The scales* are definitely greasy After one two or three weeks, the redness and scaliness become less marked and *the skin gradually returns* to normal There are no constitutional symptoms other than a moderate secondary anemia The *lymph nodes* are not enlarged or are only slightly enlarged at the height of the disturbance. Gastrointestinal disturbances are common and are most often seen in the form of diarrhea, although this symptom is not essential for diagnosis. A slight leukocytosis may be present. The general *health of the child* is good and sleep is but little disturbed because there is no itching.

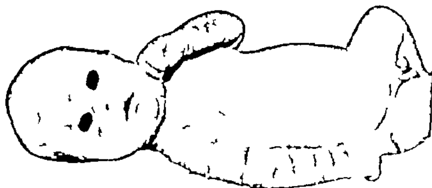


Fig 41 —Leiner s disease. Onset was at age 3 months. Note profuse scaling of entire body (Courtesy of Dr Thomas Butterworth)

Diagnosis.—Diagnosis is comparatively simple. The diagnostic features are the sudden appearance of a fiery red skin (erythematous spots) at first localized but rapidly becoming generalized, in infants usually between the first and second month. This erythema is followed by a profuse scaliness. Desquamation is less pronounced on the flexures and *the intertriginous* areas. The scalp shows a definite seborrheic dermatitis. The condition clears without *recurrence in three or four weeks.*

Leiner's disease should be differentiated from atopic dermatitis, atopic erythroderma congenital ichthyosiforme erythroderma, dermatitis exfoliativa neonatorum and dermatitis exfoliativa epidemica.

Differential Diagnosis.—Differentiation from *atopic dermatitis* is not always easy particularly in the early stages when single erythematous spots are present Too the *complicating* seborrheic picture on the scalp frequently seen in atopic dermatitis may resemble that of Leiner s disease. The important *difference* between atopic dermatitis and Leiner s disease is the presence of vesicles (edema) in atopic dermatitis these are never found in Leiner s disease.

TABLE 14.—TYPICAL DRUG ERUPTIONS FROM SOME REMEDIES PRESCRIBED FOR INFANTS AND CHILDREN

Drug	Type of Eruption							
	Ery.	Scr.	Mac.	Pap.	Exf.	Bul.	E.m.	Pr.
Acetophenetidin	+						+	+
Aminopyrine		+	+	+		+	+	
Antipyrine		+	+	+		+	+	
Arsenicals	+	+					+	
Bromides	+	+	+	+				
Barbiturates							+	
Chloral Hydrate		+	+	+				
Chlortetracycline			+	+				
Cinchophen		+	+	+		+	+	+
Gold Salts	+	+	+	+			+	
Hydantoins	+	+	+		+	+		
Iodides	+	+	+	+	+			
Liver Extract	+							
Mercurials	+	+	+	+				
P-aminosalicylic acid		+	+	+				
Penicillin	+	+	+	+	+	+	+	+
Phenylbutazone	+		+	+				
Quinacrine		+	+	+		+		
Quinidine		+	+	+				+
Quinine	+	+	+		+			+
Salicylates	+	+	+	+				
Sera	+	+	+					
Stilbestrol			+	+				
Streptomycin	+	+	+	+			+	
Sulfonamides					+	+		+
Thiamine	+		+	+				
Thiosulfate						+		+
Thiouracil			+	+				
Tragacanth	+		+					
Viomycin								+

E—erythematous
S—scarlatiniform
Mac—macular
Pap—papular
Exf—exfoliative
Bul—bullous
Em—erythema multiforme
Pr—purpura simplex

Various unlisted medications most frequently incriminated as cause of eruption.

Modified from Drug Eruptions, Doctor Panorama No. 6, Bloomfield, N. J., Schering Corporation, 1957

sunlight), bullous erythema, jaundice with hemolytic anemia associated with the skin eruption, serum sickness, with fever or asthma, polyarteritis.

Phenobarbital and Other Barbiturates.—Maculopapular to morbilliform eruption starting on the face and neck and spreading to other parts of the body. Fever, urticarial and purpuric eruptions, erythema multiforme, fatal exfoliative dermatitis (mostly after phenobarbital), fixed drug eruption, stomatitis.

Codeine.—Erythematous, maculopapular, vesicular urticarial eruption, possible pruritus.

Streptomycin.—Severe urticaria usually appears in one week *after* the drug is administered. Exfoliative dermatitis, toxic effects on the eighth nerve, aplastic anemia.

Phenolphthalein.—Fixed drug eruption. The rash is pink at first, then purplish and may even turn brown. (Fig. 42, *D*)

Bromides.—Erythematous, pustular, urticarial, furunculoid, bullous, erythematous nodosum-like lesions (Fig. 42, *C*). Frequently bromides and iodides are contained in proprietary preparations.

Iodides.—Nodular, acneform, bullous, vege-

being taken in his test series by 450 children of whom 306 were allergic. Six (1.9 per cent) of these latter developed allergic reactions to aspirin no allergic reactions occurred in the 144 non-allergic children. He found that in order of frequency other drugs most commonly used in pediatric practice in Rochester New York are penicillin, sulfonamides phenobarbital codeine, Aureomycin Pyribenzamine, ephedrine Benadryl Terramycin other antihistaminics, aminophyllin, epinephrine, other sympathomimetics, opiates other than codeine atropine, sedatives other than phenobarbital iodine and streptomycin. He adds "It is an interesting commentary on present day methods of treatment, concerning which time will give the ultimate judgment, that penicillin is used almost as frequently as aspirin and these are the two most commonly employed in pediatric practice"

Drug reactions may occur from remedial agents taken by *mouth* when introduced into the body parenterally and when used topically on the skin in the form of ointments, creams and in the form of shake lotions While sensitization may occur through a normal epidermis, the *possibility of sensitization* is even greater in the case of a sick skin of which the epidermis is the seat of an acute inflammatory disturbance characterized by erythema, edema, vesicles, bullae fissures, etc. particularly where the corium is exposed. Drugs and chemicals related either chemically or biologically—for example, the various sulfonamides (sulfoacetamide is an exception) and mercurials—may be responsible for sensitization in the phenomenon known as cross sensitization."

The eruption resulting from a drug reaction *may be local to certain areas of the skin*, the face, trunk hands and feet, or it may be generalized. Usually the lesions are found to be symmetrically distributed and the rash as a rule appears suddenly It is of a bright red color and *may be with or without constitutional symptoms*. It disappears after the offending drug is discontinued although the disappearance may take weeks and even months. This is particularly true with the halogens bromides and iodides. In making *a diagnosis* of a drug eruption a history of the ingestion of a particular drug or the use of a remedy can usually be obtained It is axiomatic as has already been stated, that a drug eruption clears up after the offending remedy is discontinued As a further test that a drug is responsible for a particular reaction, its production of a similar eruption upon readministration proves it to be the offender *However such test should be carried out with greatest precaution since untoward reactions have followed and fatalities have also been reported*

The clinical manifestations of drug eruptions are various depending on the particular drug responsible and the route by which it was administered Some of the typical drug eruptions and their causative drugs are summarized in Table 14 In general the signs include erythema angioedema vesicles bullae, or an eczematous state characterized by edema (exudation) and scaling. Again, the skin reaction may appear as a frank folliculitis (acneform eruption) Finally vegetating lesions (from bromides) and ulcerating lesions furunculoid and carbunculoid may be part of the clinical picture. By a "fixed drug eruption is meant that the signs of a drug eruption are restricted or remain fixed upon certain areas of the skin Examples of a fixed drug eruption are seen after the use of phenolphthalein sodium salicylate and also of aspirin.

After the fixed drug eruption has completely disappeared, the readministration of the drug *which caused the rash* will again reproduce a similar picture on the same area of the skin previously affected

The following reactions *from drugs are those* more commonly encountered in pediatric practice

Aspirin (Acetylsalicylic Acid)—Massive angioedema about the head and face, also on the palms and soles asthmatic seizures.

Penicillin—Atypical id' reaction from a few hours to a day after the antibiotic has been prescribed Lesions appear in the groin, on the flexor and the interdigital surfaces. Anaphylactic shock has been reported Serum sickness occurs one or two weeks following penicillin therapy and may last for weeks also urticaria and angioedema

Sulfonamides—Maculopapular and morbilliform eruption (Fig. 42, *A*) with fever an erythematous eruption (photosensitization to

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	Ery	Scr	Mac.	Pap	Exf.	Bull.	Em.	Pu.
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Aminopyrine		+	+	+		+	+	
Antipyrine		+	+	+		+	+	
Arsenicals	+	+					+	
Bromides	+	+	+	+				
Barbiturates							+	
Chloral Hydrate		+	+	+				
Chlortetracycline			+	+				
Cinchophen		+	+	+		+	+	+
Gold Salts	+	+	+	+			+	
Hydantoins	+	+	+		+	+		
Iodides	+	+	+	+	+			
Liver Extract	+							
Mercurials	+	+	+	+				
P aminosalicylic acid		+	+	+				
Penicillin	+	+	+	+	+	+	+	+
Phenylbutazone	+		+	+				
Quinacrine		+	+	+		+		
Quinidine		+	+	+				+
Quinine	+	+	+		+			+
Salicylates	+	+	+	+				
Sera	+	+	+					
Stilbestrol			+	+				
Streptomycin	+	+	+	+			+	
Sulfonamides					+	+		+
Thiamine	+		+	+				
Thiosulfate						+		+
Thiouracil			+	+				
Tryparsamide	+		+					
Viomycin								+

Ery—erythematous
Scr—scarlatiniform
Mac—macular
Pap—papular
Exf—exfoliative
Bull—bullous
Em—erythema multiforme
Pu—purpura simplex

Asterisk indicates medications most frequently incriminated as cause of eruption.

Modified from *Drug Reactions Dermal Responses* No. 6, Bloomfield, N. J., Schering Corporation, 1957

sunlight) bullous erythema, jaundice with hemolytic anemia associated with the skin eruption, serum sickness, with fever or asthma, polyarteritis.

Phenobarbital and Other Barbiturates.—Maculopapular to morbilliform eruption starting on the face and neck and spreading to other parts of the body. Fever, urticarial and purpuric eruptions, erythema multiforme, fatal exfoliative dermatitis (mostly after phenobarbital), fixed drug eruption, stomatitis.

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Phenolphthalein.—Fixed drug eruption. The rash is pink at first, then purplish and may even turn brown (Fig. 42, *D*).

Bromides.—Erythematous, pustular, urticarial, furunculoid, bullous, erythematous nodosum-like lesions (Fig. 4, *C*). Frequently bromides and iodides are contained in proprietary preparations.

Iodides.—Nodular, acneform, bullous, vege-

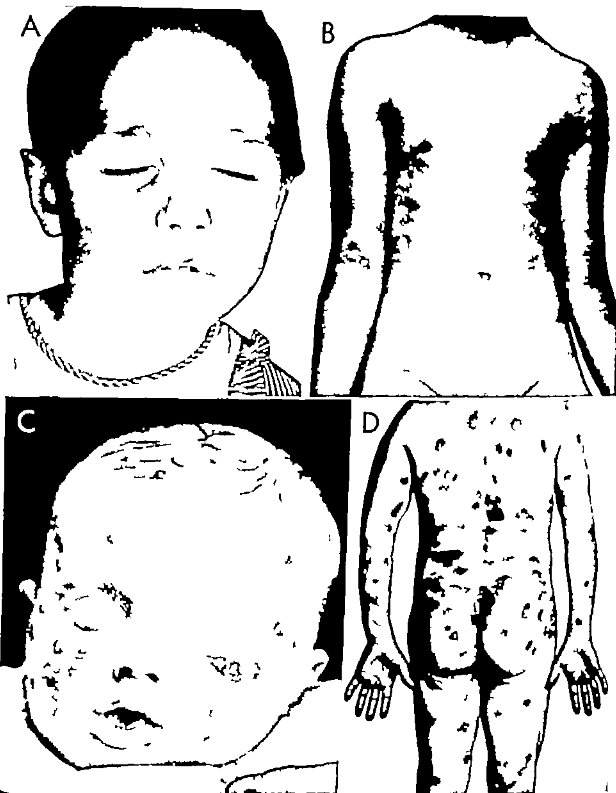


Fig 42.—Drug eruptions. A, from sulfa drugs. Note that the lesions strongly resemble the butterfly pattern of lupus erythematosus, for which testing brought negative results (Courtesy of Dr Meyer L. Niedelman.) B from phenylethylhydantoin (nirvanol) administered to the 9½ year-old girl for the treatment of chorea. C, from bromide administered to the mother who transmitted it to her infant through breast milk. Many of the lesions are crusted. (Courtesy of Dr John C Belisario Photography Mr Woodward Smith Department of Artistry University of Sydney) D from phenolphthalein. Photograph taken after four-day duration.

tative, carbunculoid, erythematous, purpuric, papular and urticarial lesions. Extremely variable picture.

Belladonna (Atropine).—Erythematous, scarlatiniform lesions, high fever convulsions.

Chloral Hydrate.—Erythematous, urticarial, papular vesicular lesions.

Quinine Salts and Derivatives.—Erythematous, scarlatiniform, bullous lesions.

Salicylates (Sodium Salicylate).—Erythematous, purpuric lesions.

Arsenic (Fowler's Solution).—Erythematous, pigmentary keratotic, zosteriform lesions.

Aureomycin and Other Antibiotics.—Mostly from topical use on the skin. Urticarial lesions, angioedema.

Ephedrine.—Eczematous dermatitis.

Epinephrine.—Persistent urticarial reactions.

In looking for clues to the offending drugs, the following guide is often of diagnostic help

For patients with these reactions:	*Think of these as possible offenders:*
Urticaria (or angio-edema)	Serum sickness
Massive giant hives	Aspirin or penicillin. (May show dermographism following penicillin)
Small hives	Sulfonamides and barbiturates
Chronic urticaria (resistant)	Penicillin and other antibiotics, aspirin, procaine and procainamide, mercurial, common analgesics, barbiturates, sulfonamides, bromides, iodides, dimercaprol, quinine-quinidine-cinchophen, the thiouracils, dextran Less frequent offenders are epinephrine, atropine, cortisone, and insulin, thiamine and nicotinic acid
Eczematous dermatitis (Prolonged or repeated contact with drug is usually responsible)	Mercurial antiseptics (after skin has been traumatized). Almost all dermatologic agents, antibiotics, sulfonamides, ingestion arsenicals, mercurials, penicillin, quinacrine, sulfonamides
Serum sickness-like. (Serum sickness pattern or delayed urticarial reaction)	Penicillin
Serum sickness	Sera, penicillin, streptomycin, sulfonamides, thiouracils, salicylates, mercury, arsenic, iodides, liver extract, quinine, hydralazine
Asthma-like features	Acute anaphylaxis incidental to serum sickness; inhalants, powdered ipecac; ingestion of plant materials such as karaya, tragacanth, papain; skin contact with tannic acid, infusion containing acacia, aspirin

Treatment.—Prevention of drug eruptions is, of course, not always possible unless the patient's sensitivity to a drug is already known to the physician. Accordingly the first step in management is a correct diagnosis. The use of even common remedies has often resulted untowardly and has even produced fatalities. Therefore it is always a good plan in taking a dermatologic history to inquire whether a patient reacts to certain drugs and antibiotics such as aspirin and penicillin. Once such a history is obtained, notation should be made so that possible trouble may be avoided in prescribing. Unfortunately there is no test helpful in foretelling whether child is susceptible to reaction from given drugs, chemicals or antibiotics.

In children, after a diagnosis of an allergic drug reaction has been established, the drug or prescription presumed to have caused the reaction should be discontinued at once. A thorough physical examination should follow including complete blood count and urinalysis to determine if there have been any untoward effects from the drug on the bone marrow and the urinary system.

For *penicillin sensitivity* the antihistaminic drugs are at times helpful. If one of the drugs belonging to the antihistaminic group fails to accomplish the desired therapeutic effect, another of that series should be tried. Our experience has been that reactions to penicillin are rather persistent, probably because a considerable amount remains in the liver which serves as a reservoir for the antibiotic. For *bromide eruption* sodium chloride administered in the form of tablets (1 Gm. three or four times daily) will hasten the elimination of the halogen from the blood system (replacement therapy). Or infusions of isotonic saline solution may be used daily for several days. *Arsenical eruptions*

and those due to other heavy metals respond satisfactorily to dimercaprol (BAL)

For the immediate effects arising from any drug reaction, epinephrine solution (1 1000) should be given without delay The initial dose (0.5 cc) should be repeated within 15 minutes, *if indicated* In hyperacute cases, the dose should be administered intravenously Oxygen and artificial respiration are indicated when respiratory embarrassment follows or accompanies drug reactions. Recently the adrenocortical steroids have been found to be most useful in therapy They should be administered in adequate dosage at proper intervals until improvement follows Transfusions may likewise be called for and the use of antibiotics to overcome secondary infection For liver damage, bed rest, a liberal carbohydrate diet, with a minimum of protein and an adequate fluid intake are in order

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12

Maculopapulosquamous Eruptions

THE MACULOPAPULOSQUAMOUS eruptions, as the term indicates, are characterized by the presence of macules, papules and scales. The clinical pictur of the particular dermatosis may show only one or all three types of lesions at a time. For example, the guttate type of psoriasis in children may be represented by numer ous erythematous macules or maculopapules covered by dry silvery scales and in pityriasis rosea both macular circinate and papular lesions may be present at the same time

Pityriasis Rosea

Pityriasis rosea is mild inflammatory kin affection characterized by round or oval, discrete or confluent salmon tinted, slightly scaly macules or rings. The disease is self-limited, with untreated patients demonstrating complete involution of the lesions in from six to ten weeks.

The term "pityriasis rosea is derived from the Greek word "pityriasis meaning scale (or more literally bran) and the Latin word "rosea meaning pink or ose-colored. With the exception of the herald patch, which precedes the generalized eruption by approximately week or more, the early lesions vary considerably there being several varieties of the disease which are often confusing and misleading to the uninitiated The herald or primitive" patch is frequently mistaken for that of tinea corporis, for the lesion is definitely circinate and grossly resembles that of tinea circinata.

In children, as well as in adults, there are two dominant types of pityriasis rosea, the macular and the papular The papular (f llicular) and maculopapular eruptions are more frequently seen in the Negro race. The following classification by Klauder is useful from a practical point of view

Macular	Punctate	Bilateral	
		Unilateral	
	Guttate	Generalized	
		Localized	
	Nummular	Confluent and Diffuse	Pityriasis rosea gigantea (Darier)
	Circinate		Pityriasis circiné et marginé (Vidal)
	Urticarial	Pityriasis rosea urticata (Vorner)	
		Urticaria pityriasis rosea (Hallopeau)	
Papular	Maculopapular		
	Follicular		
	Miliary	Large	
		Small	
Vesicular	Pityriasis rosea with vesication		

The disease was first described by Gibert in 1860 but his description applied only t the macular type. In the United States, Louis

Duhring is credited with the first description of *pityriasis rosea*.

Etiology.—Pityriasis rosea is rarely seen in infants and is uncommon in very young children and in the aged It is usually seen in white persons, but the disease is by no means limited to them

Most dermatologists are inclined to regard pityriasis rosea as a mildly contagious disease. In all probability it is due to a virus which enters through the upper respiratory tract although the viral nature of the disease has never been definitely established. A change in the outer clothing and underwear during the spring and fall seasons is thought to be a factor in the etiology

Clinical Picture —THE HERALD PATCH.—This is also spoken of as the initial lesion the "primitive patch or the mother lesion," since it is usually the first clinical sign and usually precedes the generalized eruption by several weeks (*Fig.* 43) Usually there is but a single herald patch. However there may be two or even more Frequently *it is overlooked It may vary in size from a five-cent piece to a silver dollar It has a gross resemblance to ringworm of the glabrous skin in that the lesion is round or oval-shaped, although lacking the clinical characteristics of ringworm The border of the lesion is not raised and there is no clearing in the center as in ringworm Too there is not the characteristic scaliness of the lesions that is seen in ringworm and microscopic examination of the scrapings of the scale fails to reveal* the presence of mycelial threads. Culture upon *Sabouraud's medium reveals no fungi*. The herald patch may appear anywhere upon the body except perhaps upon the hands and feet. The face is a common site.

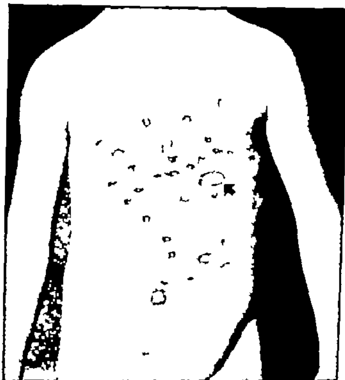


Fig. 43 —Pityriasis rosea Early lesions. Note the sentinel patch below the precordial region. (Courtesy of Dr C S. Wright and Dr R Friedman.)

GENERALIZED ERUPTIONS.—The papular *type of eruption is especially common in children* particularly Negro children. In the majority of instances it involves the entire *trunk, and* less frequently the upper and lower extremities. The hands and feet are usually free of lesions. The face is supposedly free of lesions although experience shows it is not infrequently involved *in children*.

The other common variety of pityriasis rosea is the macular type. More frequently one sees combination of both macular and papular lesions, the so-called maculopapular pityriasis rosea in children.

Clinical Course.—The eruption may reach its height in the course of a few days. The rash disappears spontaneously in about six to eight weeks, with an average duration from five to six weeks.

The individual macular lesions are either circinate or oval-shaped, of a pinkish salmon color and have a fine, thin, crinkled and dry scale, which has been compared to cigarette paper (Fig. 44). After a short time the scale loosens in the center but the edges remain attached peripherally. The long axis of the macule follows the lines of cleavage of the chest, and the entire configuration has been likened to an inverted Christmas tree with the base of the tree directed upward and the apex downward upon the chest, abdomen and back. Itching is slight in some children, while in others it is moderately severe. During the height of the eruption, children frequently complain of a burning sensation of the skin. Apart from the pruritus, the condition is asymptomatic except for prodromal complaints of sore throat, malaise and headache. Occasionally the cervical glands are enlarged and there may be a slight elevation of temperature. Early the symmetrical arrangement of the papular lesions upon the upper and lower extremities and the trunk may simulate an "id" reaction.

The lesions of pityriasis rosea are limited mostly to the trunk. In order of frequency other affected areas include the face, neck, shoulder, arms, forearms, hand, axillae, genitocrural parts, buttocks, thighs, legs and soles. The incubation period may vary from a few days to a

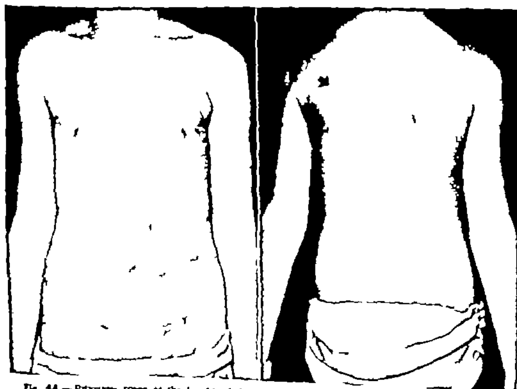


Fig. 44.—Pityriasis rosea at the height of the eruption in a school girl. Note that the lesions end abruptly at the upper level of the buttocks. The posterior surfaces of both upper extremities are for the most part uninvolved. The remains of the herald patch can still be seen over the left shoulder blade. (By permission, from J. Pediat. 40 109-129, Jan. 1952.)

Duhring is credited with the first description of pityriasis rosea.

Etiology—Pityriasis rosea is rarely seen in infants and is uncommon in very young children and in the aged It is usually seen in white persons but the disease is by no means limited to them.

Most dermatologists are *inclined to regard* pityriasis rosea as a mildly contagious disease. In all probability it is due to a virus which en-

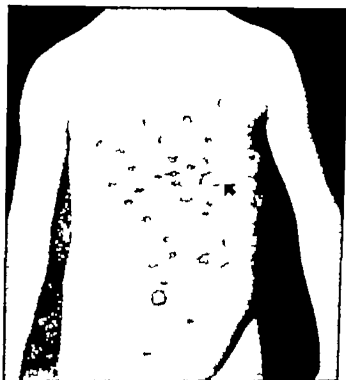


Fig. 43—Pityriasis rosea. Early lesions. Note the sentinel patch below the precordial region. (Courtesy of Dr C. S. Wright and Dr R. Friedman.)

ters through the upper respiratory tract, although the viral nature of the disease has never been definitely established A change in the outer clothing and underwear during the spring and fall seasons is thought to be a factor in the etiology

Clinical Picture—THE HERALD PATCH—This is also spoken of as the "initial lesion" the "primitive patch," or the "mother lesion" since it is usually the first clinical sign and usually precedes the generalized eruption by several weeks (Fig. 43) Usually there is but a single herald patch However there may be two or even more. Frequently it is overlooked. It may vary in size from a five-cent piece to a silver dollar It has a gross resemblance to ringworm of the glabrous skin in that the lesion is round or oval-shaped, although lacking the clinical characteristics of ringworm. The border of the lesion is not raised and there is no clearing in the center as in ringworm. Too there is not the *characteristic scaliness of the lesions that is* seen in ringworm and microscopic examination of the scrapings of the scale fails to reveal the presence of mycelial threads. Culture upon Sabouraud's medium reveals no fungi The herald patch may appear anywhere upon the body except perhaps upon the hands and feet. The face is a common site.

GENERALIZED ERUPTIONS.—The papular type of eruption is especially common in children, particularly Negro children. In the majority of instances it involves the entire trunk, and less frequently the upper and lower extremities. The hands and feet are usually free of lesions. The face is supposedly free of lesions, although experience shows it is not infrequently involved in children

to worsen the dermatosis. Accordingly the use of ordinary soap is contraindicated. Cleansing may be accomplished by colloidal starch baths or oatmeal baths, which are useful and tend to soothe the highly irritated skin. The liberal use of talcum powder containing menthol and phenol and a daily bath of starch or oatmeal water (1 lb. to 30 gal. water) is useful. Emulsions and creams are the ideal preparations for topical use. Shake lotions that are drying should be avoided.

See Formulary ℞ 35 for keratolytic; 69 to which should be added 1 per cent liquor carbonis detergens as antipruritic; and 77 for antiphlogistic and antipruritic.

Seborrheic Dermatitis of Scalp and Body

The term seborrhea, literally meaning an outflow of serum and coined by Fuchs in 1840 is used to denote an excessive oily secretion in the scalp and skin derived from the sebaceous glands. The condition manifests itself in three types: the dry type, seborrhea sicca, the oily type, seborrhea oleosa, and the waxy type, pityriasis steatodes. The term "pityriasis simplex," used by the French and referring to the dry type of seborrhea, is synonymous with seborrhea sicca. The common varieties of seborrheic dermatitis seen in infants and children are the dry slightly scaly type of the glabrous skin, and the oily crusted form in the scalp, the latter known as cradle cap or milk crust. Both types may exist together or independently.

Seborrheic Dermatitis of the Skin

Seborrheic dermatitis of the skin is a mild inflammatory condition characterized by dry or greasy oily scales and tends to recur. It is also known as eczema seborrheicum (seborrheic eczema) and seborrhea corporis.

The exact cause is unknown, although a micro-organism has been incriminated, its role is still controversial. Sabouraud claimed to find a microbacillus; other investigators believe the cause is a lipophilic, pleomorphic fungus, pityrosporum ovale. Endocrine disturbances and gastrointestinal disorders have also been incriminated in older children and adults. It is during adolescence, when the sebaceous glands become active after causing acne and dandruff, that seborrheic dermatitis is particularly common.

Clinical Picture.—The favorite sites are those regions richly supplied with sebaceous glands (Fig. 45) particularly the scalp, root and sides of the nose, nasal fold, areas behind the ears and around the mouth, the axillae, the

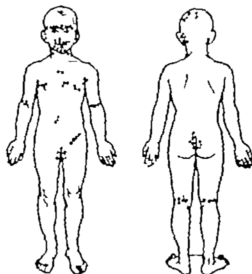


Fig. 45.—Distribution of the sebaceous glands in the skin. The black dots indicate areas of the skin richly endowed with sebaceous glands and those sites more frequently affected in seborrheic dermatitis of the glabrous skin and scalp.

areas over the sternum and spinal column, umbilicus, groins, genitals and perianal region.

Upon the skin seborrheic dermatitis begins either as a papular folliculitis which enlarges to form a plaque or as circinate or oval, yellowish or reddish-yellow scaly lesions. They are demarcated and somewhat greasy to the touch or are covered by dry scales or they may be exudative and followed by crusts. Frequently the oval lesions follow the lines of cleavage, resembling full-blown lesions of pityriasis rosea. Seborrheic dermatitis of the axilla and intercrural regions may closely simulate tinea cruris, at times making clinical differentiation difficult. During hot, humid weather the

month or more There is no characteristic blood picture although eosinophilia and lymphocytosis are sometimes seen.

Diagnosis.—The harbinger is a herald (primitive) patch which is generally mistaken for ringworm of the skin and which is most often seen upon the trunk although it may appear anywhere. The eruption itself is at first macular papular maculopapular or vesicular and for the most part is distributed upon the trunk. In children the scalp is frequently involved as are also the mucous membranes of the mouth. The oval-shaped lesions tend to follow the cleavage lines of the ribs The full blown rash presents at its height the outline of an inverted Christmas tree as has already been described.

Differential Diagnosis.—The important dermatoses with which pityriasis rosea may be confused include tinea circinata the macular syphilid psoriasis disseminated seborrheic dermatitis, lichen planus and scabies.

Pityriasis rosea is most often mistaken for *tinea circinata* but it is differentiated from it by the herald patch and by the lack of a raised peripheral border on its macular lesions. Ringworm of the glabrous skin spreads peripherally so that there is soon a ring within a ring with the center tending to clear and scraping of the scale and culture will disclose mycelial threads and fungi upon Sabouraud's medium

The most important single point differentiating the *macular syphilid* from the macular lesion of pityriasis is the non scaliness of the former The macules in syphilis are smaller than those of pityriasis and of a reddish brown or copper color and they involve the palms and soles areas seldom affected in pityriasis rosea In syphilis, there are frequently a history of infection a positive result from serologic blood test, and concomitant signs of syphilis such as mucous patches, syphilitic rhinitis enlarged liver and spleen.

The scale of *psoriasis* is characterized by an imbricated mother-of-pearl heaped-up appearance which in typical cases renders diagnosis easy The lesions of psoriasis are more acutely inflamed and are a much brighter red than the salmon-colored pink scale of pityriasis rosea Further psoriasis is a chronic dermatosis, returning time and again, in contrast to pityriasis rosea which is generally characterized by a single attack. The violaceous polygonal lesions of *lichen planus* which have a predilection for the anterior surfaces of the wrists, the ankles and the inner sides of the legs, are absent in pityriasis rosea. The greasy scaly lesions of *seborrheic dermatitis* are found over areas of the skin richly endowed with sebaceous glands, such as the scalp eyebrows, behind the ears, the nasolabial folds sternum and spinal column umbilicus, flexures of the extremities and creases of the groin. The condition involutes more slowly than pityriasis. The scales of seborrheic dermatitis are coarser greasier and more abundant.

Scabies is sometimes confused with the papular type of pityriasis rosea. However the presence of burrows in scabies and their absence in pityriasis are diagnostic. The itching of scabies is characteristic in that it is invariably worse at night. Finally the presence of scabies among other children or in members of the family and the identification of the acarus are conclusive diagnostic points.

Complications and Prognosis.—No serious complications follow pityriasis rosea. Scratching caused by pruritus which is usually of moderate severity during the height of the dermatosis, may be followed by eczematization or impetigo contagiosa or both

The prognosis is good Involution generally occurs in from four to six weeks.

Treatment—The remedies that have been employed are legion Perlman and Lubowe have found that typhoid-paratyphoid vaccine given subcutaneously in doses of 0.5 cc. every fourth or fifth day for a total of three doses causes involution of the lesions within a few weeks Ultraviolet light from the mercury vapor quartz lamp is a most useful form of therapy and popular among dermatologists. Frequently the inoculation of auto-blood (10 cc.) taken from the patient's median basilic or cephalic vein and introduced intramuscularly into the buttock has proved effective both in relieving the pruritus and in hastening disappearance of the lesions.

The use of soap and water perhaps because of the alkali contained in the soap tends

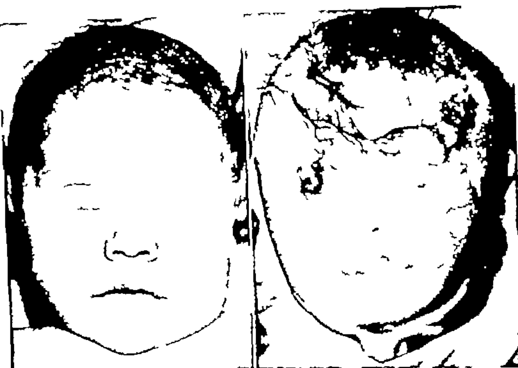


Fig. 46.—Seborrheic dermatitis (cradle cap milk crust) in an infant 8 weeks of ge. When first seen, this infant presented diffuse, reddish brown rash with numerous greasy scales over the entire scalp the nasolabial fold, eyebrows, root of nose, behind both ears, on both cheeks and on the anterior aspect of the neck.

ered with a crusted mass which sits like a cap. Crusts or scales removed with a fine comb or forceps re-form rapidly Occasionally the scalp acquires an offensive odor not unlik that of sour milk, which is due to decomposition of the debris. Other areas, such as the eyebrows, gla bella, sides of the nose and cheeks usually share in the process.

Diagnosis and Treatment.—Seborrheic der matitis of the scalp is recognized as a dry oily scale dermatitis affecting the scalp irregularly or covering it entirely It responds to antisebor rheic remedies. It must be differentiated from psoriasis nd tinea capitis.

Psoriasis is rare in infants and in children under 5 years of ge, while seborrheic dermatitis of the scalp is a common dermatitis of baby days. Psoriasis shows thick masses of dry scales, whereas in seborrheic capitis the scales are oily or greasy *Tinea capitis* is practically never seen in young babies at the time when sebor rheic capitis is common.

The management for seborrheic dermatitis of the scalp is similar to seborrheic dermatitis of the glabrous skin. The following is a representive prescription.

℞

Salicylic acid (? 5%)	2.0-5 0
Castor oil	
Olive oil aa q ad	100 0
Misce et fiat	
Signa: Apply to scalp	
Indication. Antiseborrheic	

(Klemschmidt)

See Formulary ℞ 17 (adolescence) for keratolytic, antiseborrheic, useful for dark hair only since it is likely to discolor light hair (blonds) and useful for dandruff in older children, 18 for excessively dry scalp· 44 for antiseborrheic remedy

lesions may become eczematized through rubbing or scratching. Pruritus is a common complaint among older children. There are no constitutional symptoms.

Differential Diagnosis.—Seborrheic dermatitis of the glabrous skin must be differentiated from the papular syphilid, psoriasis, pityriasis rosea and *tinea cruris*.

The *papular syphilid* is of a copper color and other concomitants of syphilis are present. The patient's and its mother's blood give positive serologic reactions. *Psoriasis* in children may be of the guttate type. The lesions may consist of localized plaques. The scalp is often involved in children. In typical cases the lesions appear as silvery micaceous scales and when forcibly removed the surface of the lesions show a number of bleeding points. The *localized type of psoriasis shows a predilection* for the elbows, knees, and extensor surfaces. The oval or circinate lesions of seborrheic dermatitis may resemble those of *pityriasis rosea* especially when they follow the lines of cleavage on the chest and abdomen. However in seborrheic dermatitis the scale is reddish or yellow red, not pinkish as in pityriasis rosea and the scale is much finer and more granular nor does it break in the center. Also in pityriasis rosea, the initial lesion precedes the full-blown *clinical picture by a week or two. Tinea cruris* may be mistaken for seborrheic dermatitis, especially when the plaques are sharply marginated in the crural areas, axilla or intergluteal cleft. However in seborrheic dermatitis the border of the lesions is generally not so well defined as it is in mycotic infections and the scale is finer. The acute redness characteristic of mycotic infection is lacking in seborrheic dermatitis the lesions are reddish or yellowish red. Finally scrapings of the scale and examination in a few drops of 10 per cent potassium hydroxide solution will demonstrate the mycelial threads in ringworm and culture upon Sabouraud's medium will disclose the fungus.

Complications and Prognosis.—Secondary infection (impetigo contagiosa) and periporitis *staphylogenes* are not uncommon. In long standing cases adenopathy occurs. Seborrhea corporis responds less rapidly than seborrhea capitis *to antiseborrheic remedies*. In fact, it may become persistent and recalcitrant to such therapy. Recurrences are common.

Treatment and Prophylaxis.—Management is directed toward removing the cause, if this is *possible, removal of crusts and scales by use of* the proper topical remedies, and prevention of complications and recurrences.

The mother should be urged to prevent over feeding. In obese infants the fat content of the milk should be reduced. A hyperoilated super fatted soap should be used for cleansing the skin and the scalp should be shampooed once or twice weekly.

Keratolytics are indicated. Many are available such as precipitated sulfur, salicylic acid, ammoniated mercury and resorcin; all of the tars are keratolytic. They may be prescribed singly or in combination in the form of ointments *or creams or as scalp lotions for older* children. In general, ointments are more efficacious than liquids. Shampoos, too, have a certain usefulness in older children. *A standard* prescription frequently ordered consists of the following:

℞

Precipitated sulfur (3%)	3 6
Salicylic acid* (3%)	3 6
Rose water ointment†	120 0

Misce et fiat unguentum
Signa. Apply by inunction three times daily.
Indication. Keratolytic, for seborrhea capitis or seborrhea corporis.

SEBORRHEIC DERMATITIS OF THE SCALP

Clinical Picture.—Seborrheic dermatitis of the scalp (also known as cradle cap or milk crust) is particularly common during infancy. It may be mild or severe. Since after the neo*natal period the vernix caseosa* sometimes persists, it may be only after several weeks that the true nature of the scalp condition becomes *apparent. Usually the scalp is* covered with yellowish or yellowish-red scaly or crusted patches (Fig. 46). When the scales are placed *between blotting paper they leave a fat stain*. In severe cases the entire scalp may be cov-

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*Salicylic acid cannot be prescribed in stronger con*centration than 3 per cent in rose water ointment because it will cause the rose water ointment to crack.

†The writer prefers Rose Water Ointment U.S.P. without the oil *of rose*.

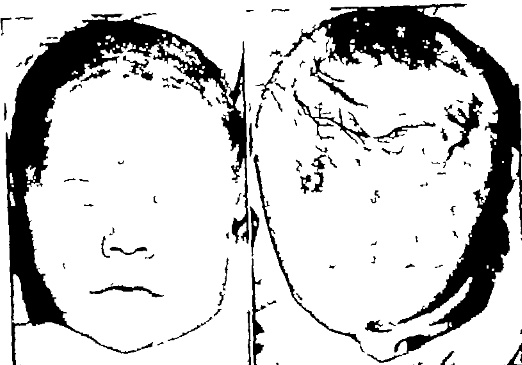


Fig. 46.—Seborrheic dermatitis (cradle cap milk crust) in an infant 8 weeks of age. When first seen, this infant presented diffuse, reddish brown rash with numerous greasy scales over the entire scalp, the nasolabial fold, eyebrows, root of nose, behind both ears, on both cheeks and on the anterior aspect of the neck.

ered with crusted mass which sits like a cap Crusts or scales removed with a fine comb or forceps re-form rapidly Occasionally the scalp acquires an offensive odor not unlike that of sour milk, which is due to decomposition of the debris. Other areas, such as the eyebrows, glabella, sides of the nose and cheeks usually share in the process.

Diagnosis and Treatment.—Seborrheic dermatitis of the scalp is recognized as a dry oily scale dermatitis affecting the scalp irregularly or covering it entirely It responds to antiseborrheic remedies. It must be differentiated from psoriasis and tinea capitis.

Psoriasis is rare in infants and in children under 5 years of age, while seborrheic dermatitis of the scalp is common dermatitis of baby days. Psoriasis shows thick masses of dry scales, whereas in seborrheic capitis the scales are oily or greasy *Tinea capitis* is practically never seen in young babies at the time when seborrheic capitis is common.

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Signa: Apply to scalp	
Indication. Antiseborrheic	

(Kleinschmidt)

See Formulary ℞ 17 (adolescence) for keratolytic, antiseborrheic, useful for dark hair only since it is likely to discolor light hair (blonds) and useful for dandruff in older children, 18 for excessively dry scalp 44 for antiseborrheic remedy

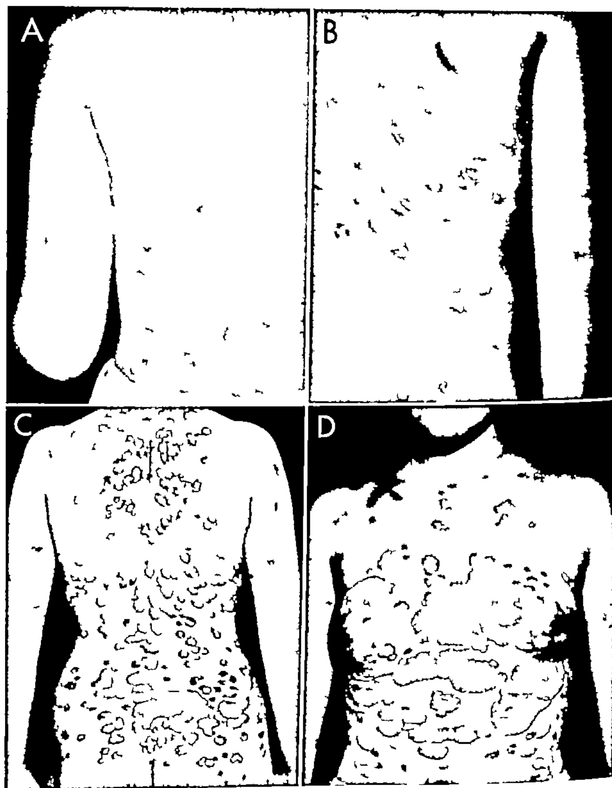


Fig 47 —Psoriasis. A guttate type in a child 12 years of age Note the small, pea-sized lesions, which were of a bright erythematous color Many lesions were capped by a silvery scale. (Courtesy of Dr Meyer L. Niedelman) B generalized, in a boy 4 years of age showing many lesions of the guttate type. Many lesions show the characteristic dry silvery scales. C and D generalized, in a girl 13 years of age. Note the circinate and irregular plaques distributed over anterior and posterior aspects of trunk and upper and lower extremities. Lesions on the anterior aspect illustrate the pattern of the geographic variety

Psoriasis

Psoriasis is a chronic, inflammatory disease of the skin characterized by erythematous, hyperkeratotic, parakeratotic patches of various shapes and sizes, with imbricated "mother-of-pearl" scale. Recurrences are the rule. It may be acute (guttate), subacute (nummular) or chronic (inveterate).

Etiology.—The exact cause is unknown. It is a constitutional disease, believed variously to be dependent on some variant of fat (lipid) metabolism, to be due to an infectious agent or a fungus and to originate in the intestinal tract. Transmission by genes has not been demonstrated, although familial occurrence may be noted in 5 to 10 per cent of all cases. No age is exempt and, although uncommon in children under 3 years of age, it has been reported in newborn infants and infants.

Psoriasis often begins in childhood or during adolescence. It is more common in males than in females and it is uncommon in Negroes. Nervous disturbances such as fright and shock frequently initiate or precipitate an attack.

Clinical Picture.—The primary lesion is a round, slightly elevated spot or spots (macules and maculopapules) of reddish, reddish-yellow or bluish-red color, pinpoint to pinhead size or somewhat larger, which disappears under pressure. The lesion does not feel infiltrated at an early stage. The earliest lesion is not obviously scaly although if rubbed with a blunt object a scale may be removed. Underlying the scale is a shiny, moist surface consisting of several minute bleeding points. The bleeding points help to confirm the diagnosis, but they are not a pathognomonic sign since they occur also in such other dermatoses as nummular eczema and neurodermatitis. These bleeding points are sometimes referred to as the Auspitz phenomenon. Another sign frequently seen, owing to scratching, is the Koebner phenomenon, which consists of a number of papules in linear arrangement. However this, like the Auspitz phenomenon, is not pathognomonic since it is seen also in such diseases as lichen planus, verruca and ivy poisoning.

Gradually the lesions enlarge and become covered with silvery micaceous scales, over the entire psoriatic patch, while the border may be erythematous. When the piled-up scales (hyperkeratosis) are removed, as by keratolytics, a smooth papule remains. Various terms have been employed to describe the differently sized lesions. Thus, the very small punctate lesions are referred to as "psoriasis punctata," the lesions like water drops as "psoriasis guttata," (Fig. 47 *A*, *B*) and those the size of a half dollar or a dollar as "psoriasis nummularis" (Fig. 47 *C*). All sizes may be present at the same time. As the lesions grow larger, well-defined plaques may form. When these cover an entire surface of the body the adjective "diffusa," "generalisata" or "universalis" is used. This last condition is almost never seen in children. On the other hand, the psoriatic lesions may involute in the center, while the peripheral border remains unchanged, thus forming ringed lesions—psoriasis annularis or circinata. Sometimes several circinate lesions coalesce and by extensions of their borders form various patterns known as "psoriasis gyrata" or "figurata." With more extensive involvement, maplike configurations—psoriasis geographica (Fig. 47 *D*)—may be seen. On the other hand, the typical psoriatic plaques, instead of appearing as heaped-up silvery scales, may assume a reddish color. Isolated small and discrete scaly patches may be seen upon the trunk at the same time as the pearly white, drop-like disseminated lesions (guttate psoriasis). Younger children as a rule do not have the localized hyperkeratotic, mother-of-pearl lesions upon the elbows and knees seen in adults. Instead, nummular lesions of silvery imbricated scales may be scattered on the trunk, arms and legs. Stippling or pitting of the nails resembling the surface of a thimble and hyperkeratosis under the nails are common in adults but are seldom seen in children.

Many of the clinical signs reflect the histopathologic picture (Fig. 48) of parakeratosis—club-shaped acanthosis of the rete pegs, thinning of the suprapapillary plates and a dilatation of the capillaries high up in the papillary bodies.

DISTRIBUTION OF LESIONS.—The guttate and nummular types of psoriasis are usually generalized on the trunk, arms and legs. Favorite sites for other forms are the scalp, extensor sur-

faces of the upper arms and legs the areas behind the ears and the sacral area. Michelson speaks of a type in which the scale collects in a cylindrical manner about the hair shafts. Except for the face almost any part of the body may become involved The lesions, usually symmetrical are distributed on the elbows and knees in older children (Fig 47 1) The nails are less often involved in children, and the mucous membranes only rarely

Diagnosis.—Psoriasis in children does not differ from that in adults. In a typical case, diagnosis is based on the symmetrical distribution of the lesions, on the elbows, the knees, the trunk and throughout the scalp The characteristic micaceous scales (mother-of pearl) yielding bleeding points upon their removal, and the *chronic course render the diagnosis comparatively simple.* In a child the history of an eruption that has failed to improve over a reasonable period should lead one to suspect psoriasis. It is uncommon in children under 5

Differential Diagnosis.—Psoriasis of the scalp must be differentiated from tinea capitis and seborrheic dermatitis (See Seborrheic Dermatitis of the Scalp Diagnosis.) Psoriasis of the trunk and extremities must be differentiated from seborrheic dermatitis atopic dermatitis, the squamous and papulosquamous syphilid, pityriasis rosea and lichen planus. Psoriasis of the face, although it rarely occurs, must be differentiated from lupus erythematosis. Psoriasis of the intertriginous areas must be differentiated from fungous infection e.g. moniliasis.

TRUNK AND EXTREMITIES.—In *atopic dermatitis* the flexures rather than the extensors are affected. The individual lesions are less demarcated than in psoriasis merging gradually into the surrounding normal skin. There is a history of weeping lesions, whereas psoriasis is a dry dermatosis. Pruritus always prominent in atopic dermatitis is seldom present in psoriasis of children. The scales of *seborrheic dermatitis* are smaller than those of psoriasis and are

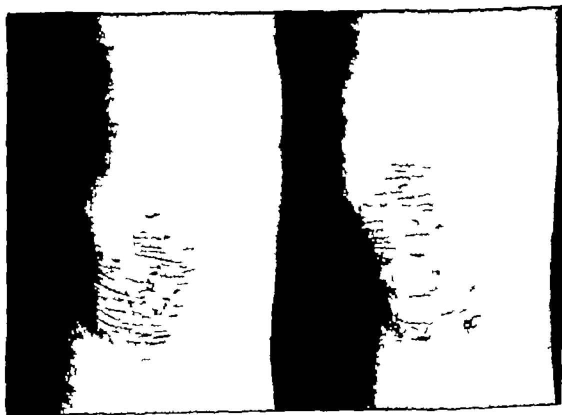


Fig. 47 1 —Localized psoriatic plaques in 10½ year-old girl. Hyperkeratotic plaques have been traumatized by scratching. (*Courtesy of the Department of Dermatology The Flower and Fifth Avenue Hospitals, New York.*)



Fig. 48.—Psoriasis. Histopathologic specimen of skin shows the parakeratosis (stratum corneum) the club-shaped acanthosis of one of the rete pegs and elongation of the rete pegs on the right and left sides of the club-shaped rete peg. The suprapapillary plates of several of the sections showed thinning. Note also that the superficial blood vessels high up in the papillary bodies are dilated. There is considerable edema of the papillae.

greasy or oily or dry. When scale is removed, instead of bleeding points on an erythematous base, an oily surface is revealed. The most important single diagnostic sign of the *syphilid* is infiltration which at once differentiates it from new psoriatic lesions, which are soft, waxy, not indurated and, when infiltrated, are never as deep as in syphilis. Furthermore, little if any scaling occurs in the syphilitic lesion. The secondary syphilid affects the face; psoriasis seldom does so. In *pityriasis rosea* the lesions are oval, of salmon color and usually follow the lines of cleavage. The generalized rash is preceded by a herald spot. Pityriasis rosea involutes in 6 to 10 weeks if untreated; psoriasis is chronic and recurs. The violaceous polygonal papules of *lichen planus* tend to differentiate it from psoriasis, along with the distribution of the former upon the trunk and inner aspects of the thighs and flexures of the legs, of the wrists and forearms and on the penis and mucous membranes of the mouth, with associated pruritus. The lesions of *tinea corporis* are fewer in number than those of psoriasis and more circular. Ringworm, clearing in the center, usually leaves an elevated vesicular border. Finally culture of the ringworm scale discloses mycelia and the fungus. Tinea corporis responds promptly to fungicidal remedies.

INTERTRIGINOUS AREAS.—Psoriasis in the groins, axillae, intergluteal and similar areas may assume an atypical appearance resembling

a fungous infection for example moniliasis Here a family history of psoriasis may be helpful. Culture of scrapings of monilia lesions will *disclose the fungus.*

Prognosis—Dermatologists do not speak of a cure in psoriasis. In children the course is generally mild The prognosis concerning life is good since most psoriatics enjoy good health however recurrences after improvement are common Lesions may disappear spontaneously but new ones soon appear In older children most lesions remain fixed, particularly those occurring in areas of predilection A few patients recover early without recurrences but for most patients psoriasis remains a lifelong disease.

Treatment—Removal of scales is important for the optimum therapeutic effect of antipsoriatic remedies. Hyperkeratotic scales may be removed by warm baths lasting half to one hour using either plain or tar soap A 3 per cent salicylic petrolatum thoroughly rubbed into the lesions is satisfactory For larger plaques 3–5 per cent salicylic acid dissolved either in liquid petrolatum *(mineral oil) or olive oil may be soaked* upon several layers of gauze and applied directly to the lesions and allowed to remain overnight. Or the following prescription may be used

℞

Salicylic acid (5%)	5.0 Gm.
Castor oil (10%)	10.0 cc.
Petrolatum q.s. ad	100 0 Gm.

Misce et fiat unguentum
Signa Apply thoroughly by inunction to lesions (*Jessner*)

After removal of scales, the keratolytic (reducing) remedy is used In prescribing antipsoriatic remedies one should remember that their use must vary from time to time to meet individual indications In general antipsoriatic remedies may be divided into three groups (1) mercurials (2) tars (3) chrysarobin and related compounds e g anthralin or anthrarobin. Other remedies include the modified Goeckerman treatment and corticosteroids.

MERCURIALS—Ammoniated mercury official in the form of Ammoniated Mercury Ointment U.S P (white precipitate ointment) contains 5 per cent ammoniated mercury but may be increased to double the official strength especially for psoriasis of the scalp For extensive psoriatic lesions, ammoniated mercury and salicylic acid in ointment form are probably the remedies of choice Ammoniated mercury is *notably more effective when combined with* tar for example liquor carbonis detergens. The following prescription illustrates such a combination

℞

Ammoniated mercury (5 15%)	5 0-15 0 Gm
Liquor carbonis detergens (5-10%)	5.0-10 0 Gm
Rose water ointment	
vel	
Lanolin	
White vaseline aa q.s. ad	100 0 Gm.

Misce et fiat unguentum
Signa Apply by inunction once daily

TARS.—The tars although their odor may be objectionable, frequently work much better than ammoniated mercury particularly the wood tars Cade oil and birch tar are the most commonly prescribed. A representative prescription is the following

℞

Birch Tar*	10.0 Gm
Ether	45.0 cc.
Alcohol	45.0 cc.

Misce et fiat tincture
Signa. Apply thoroughly to lesions as a paint with a tooth brush. Follow by an immersion bath for half to one hour Repeat once daily

Tar like other remedies is usually employed in combination for example, tar and ammoniated mercury or tar and chrysarobin. The Goeckerman treatment using tar followed by ultraviolet light is discussed separately (p 169)

CHRYSAROBIN—Chrysarobin is a mixture of neutral principals found in Goa powder obtained from the bark of trees in the damp forests of Brazil Unfortunately it is becoming difficult to obtain Anthralin is the equivalent of the European cignolin chemically it is known as dihydroxyanthranol. Because it is twice as strong as chrysarobin, anthralin should be ordered in half the strength of chrysarobin Both chrysarobin and anthralin should be used for small psoriatic patches and not for widespread psoriasis The therapeutic effect of chrysarobin is reached when the lesions become erythematous. Chrysarobin colors hair and clothing violet and may produce a violent conjunctivitis.

* Birch tar is Oleum Rusci

When it is properly employed for treatment of psoriasis, the lesions will disappear in two to three weeks. Anthralin is less liable to produce dermatitis and conjunctivitis and less likely to discolor the skin. A good rule to follow in using chrysarobin is always to begin treatment with weak (0.1 per cent) concentration. A 1 1000 or 1.3000 concentration in petrolatum and applied to the lesions will produce a mild inflammatory reaction. The proportions may then be cautiously increased to 1 500 and finally to 1 200 which usually causes the psoriatic plaques to involute. Such combinations as chrysarobin (or its closely related compound, anthralin) and tar or chrysarobin and salicylic acid are frequently employed. When chrysarobin is prescribed, frequent urinalyses should be carried out because of possibility of absorption and consequent renal irritation. Chrysarobin, not soluble in alcohol, dissolves rapidly in chloroform or gutta-percha solution and also in fatty ointment bases. The following prescription is an example

℞

Chrysarobin (0 1 1 0%)	0 09-0 9 Gm.
Liquor carbonis detergens (10%)	9 0 cc.
Chloroform q	90 0 cc.

Misce et fiat

Signa Apply with tooth brush. Three to 5 per cent salicylic acid may be added to the above prescription. (This treatment is for small psoriatic patches.) Cover with gauze after preparation is applied. After several such applications, the psoriatic plaques will turn reddish and in few days the lesions will involute

Anthralin may be applied in strength of 0.5 t 2 0 per cent for several days followed by application of the following ointment

℞

Aluminum acetate solution	10 0 Gm.
Anhydrous lanolin	20 0 Gm
Zinc oxide paste	30 0 Gm.

Misce et fiat pasta

Signa Apply p

OTHER REMEDIES.—The modified *Goeckerman treatment* consists in applying tar either crude coal tar in zinc oxide ointment, or in simple Lassar' paste at night on retiring. Or liquor carbonis detergens may be used. The excess ointment or coal tar solution is gently wiped off the following morning with a little gauze dipped in olive oil. A suberythema dose of ultraviolet light from a mercury vapor air cooled lamp is then given. A cleaner method, for office use, is to cleanse the skin and apply 10 per cent liquor carbonis detergens. The thin film of tar is allowed to remain when a suberythema dose of ultraviolet light is applied to the skin. The employment of *corticosteroids* is still in the investigative state. Indeed, these remedies have proved useful in some cases, but recurrences follow when they are discontinued.

Anthralin ointment is marketed in 0.1% 0.25% and 0.5% strength.

Representative Prescriptions

℞

Ammoniated mercury (10%)	10 0
Liquor carbonis detergens (10%)	10 0
Petrolatum	
Lanolin aa q s. ad	100 0

Signa Apply

Indication. Chronic psoriasis

(*M* Jessner)

℞

Naftalan (3%)	3.0
Petrolatum q ad	100 0

Signa: Apply by inunction

Indication: Chronic psoriasis

(F Wise)

℞

Chrysarobin (1 3%)	0 3-0 9
Traumaticin† q s. ad	30 0

Misce et fiat

Signa Use as paint, apply ith tooth brush. When dry apply purified talc as dusting powder. (The weaker concentration should be used at first and gradually increased in strength)

℞

Salicylic acid (2%)	2 4
Coal tar solution (5%)	6 0
Ammoniated mercury (5%)	6 0
Aquaphor or	
Hydrophilic petrolatum	36 0
Petrolatum q s. ad	120 0

Misce et fiat unguentum

Signa: Apply twice daily

Indication Keratolytic (reducing agent)

See Formulary ℞ 40 46, 47

Parapsoriasis

Under the term "parapsoriasis" are grouped what were formerly believed to be a number of rare dermatoses characterized by chronicity The clinical picture suggests a combination of

†Traumaticin is solution of gutta-percha in chloroform.

psoriasis, lichen planus and seborrheic dermatitis The term meaning psoriasis-like has an unfortunate connotation since the disease bears no relation to psoriasis. Although, parapsoriasis has been reported with relative infrequence in children, it is by no means a rare dermatosis. The probability is that its clinical diagnosis in children has been passed over particularly by those who are unfamiliar with the clinical signs.

The four types are classified as (1) parapsoriasis guttata, (2) parapsoriasis varioliformis (Mucha Habermann) which is a sub-variety of guttate parapsoriasis, (3) parapsoriasis lichenoides (parakeratosis variegata) and (4) parapsoriasis en plaques.

Etiology—The cause is unknown. The suggestion that tuberculosis may be an etiologic factor has not been proved. However the favorable effects of vitamin D_2 as pointed out by Canizares are interpreted by him as evidence in favor of the possibility of tuberculous causation Exposure to excessive heat has also been cited as an etiologic factor While the condition is fairly common in adults reports of instances in children are only seldom encountered in the literature.

Clinical Picture—It is generally agreed that there is no typical picture for parapsoriasis While the three varieties have a great deal in common the clinical signs vary considerably the over-all picture for each particular type depending more or less on the predominating clinical feature of the particular dermatosis to which its lesions bear a striking resemblance. Thus one patient's lesions may suggest a seborrheic dermatitis or perhaps psoriasis of the seborrheic type, while another may bear a striking resemblance to lichen planus or to pityriasis rosea. However the two distinctive features common to all varieties of the disease are their marked chronicity and their resistance to therapeutic agents.

In general, the eruption is characterized by the appearance of disseminated, brownish red or pinkish macules or variously sized, slightly raised plaques distributed mostly over the trunk and extremities. The surface of the lesions may be smooth or their center may be capped by a slightly adherent dry scale bearing a strong resemblance to the guttate type of psoriasis (Fig 49) On the other hand, they may resemble the papulosquamous syphilid. Upon removing the waferlike scale a number of fine, purpuric spots may be seen. When the lesions are examined carefully they are found to be either round or oval or perhaps lenticular in shape, showing little if any infiltration. The face, scalp, palms and soles are as a rule free of lesions. The absence of itching is generally regarded as one of the striking features of the disease, although this conclusion is not always valid since itching may be present in a mild form. New lesions continue to appear from time to time. There are no constitutional symptoms.

The characteristic clinical features of the special varieties may be summarized as follows

PARAPSORIASIS GUTTATA.—The lesions of the guttate variety closely resembling psoriasis, are characterized by numerous macules and papules scattered over a large area of the trunk and the extremities. The lesions may or may not be covered with a waferlike scale.

PARAPSORIASIS VARIOLIFORMIS (MUCHA HABERMANN)—This is a sub-variety of parapsoriasis guttata Indeed, not infrequently this type precedes the guttate form of psoriasis, which appears soon after the clinical manifestations of the Mucha-Habermann disease has subsided It may be initiated with a vesicular eruption and accompanied by mild constitutional symptoms such as malaise, slight fever and a generalized adenopathy thus it resembles varicella. Essentially this particular form of parapsoriasis is a polymorphous eruption of the skin consisting of macular and moderately scaly papular and papulonecrotic lesions which form hemorrhagic crusts that leave in their wake small whitish scars often surrounded by a halo of moderate pigmentation. New lesions continue to appear in crops while the older lesions undergo involution over a period of a few weeks.

PARAPSORIASIS LICHENOIDES (BROCQ) LICHEN VARIEGATUS (CROCKER) PARAKERATOSIS VARIEGATA (RETIFORM VARIETY OF PARAPSORIASIS)—As the name indicates, the lesions are lichenoid, the papules being distributed in net like figures over the trunk and extremities. The clinical picture may resemble lichen planus or lichen scrofulosorum The eruption consists of tiny pinhead, slightly scaly erythematous or yellowish-red papules forming irregular or rounded patches which are nonpruritic.

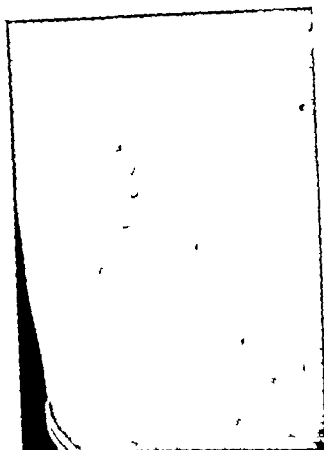


Fig. 49.—Parapsoriasis guttata of three months' duration in a boy 7 years of age. Note the widespread area of distribution of the lesions, which were a reddish color and scaly resembling psoriasis. The lesions appeared mostly on the trunk, upper extremities and thighs. There was no itching. The histopathologic picture was compatible with that of parapsoriasis the classical picture of psoriasis was absent. (Courtesy of Dr James E Bowman.)

PARAPSORIASIS EN PLAQUES.—This variety is characterized by well defined, circumscribed patches and nonelevated plaques of different shapes and sizes. The lesions, yellowish-red (although they have been described as of a me-red color) are located on the trunk and the extremities. They are either nonscaly or characterized by slight scale, they are noninfiltrated, nonpruritic and may resemble eczema.

Diagnosis and Differential Diagnosis.—Two features in particular characterize parapsoriases its chronicity that is, the persistency of the lesions, and the failure of the disease to respond to therapeutic agents. Pruritus is slight or entirely absent. However a definite diagnosis must be based not upon any one particular sign but rather upon the over-all picture, which may resemble psoriasis lichen planus or pityriasis rosea, depending upon which type is present. The histopathologic picture of parapsoriasis is not characteristic.

GUTTATE TYPE.—The guttate type of parapsoriasis may be confused with the guttate type of psoriasis. However in psoriasis the lesions are characterized by a heaped-up scale, whereas in parapsoriasis guttata there is little or no scaling. When the scale is removed in psoriasis, bleeding points are seen, when it is scratched in parapsoriasis, purpuric spots are found. For

ther lesions of the scalp are common in psoriasis in children while this region is devoid of lesions in parapsoriasis.

The scales in the psoriasiform type of *seborrheic dermatitis* are greasy and of a yellowish color. They are commonly found in those areas of the skin richly endowed with sebaceous glands, that is, the face, scalp and flexures of the joints. Yet those areas as a rule are devoid of lesions in parapsoriasis. Further antiseborrheic topical remedies usually result in a prompt improvement in seborrheic dermatitis, but they will not influence the course of parapsoriasis.

Lesions of *lichen planus* are almost invariably accompanied by itching, usually severe. On the other hand, there is little or no itching in parapsoriasis. The typical papule of lichen planus is prominent, polygonal and umbilicated, with considerable infiltration and a distinct violaceous color. The lichenoid lesions in parapsoriasis are less defined than in lichen planus, never umbilicated, without infiltration and without any purplish color.

The *papular syphilide* (maculopapular syphiloderm) definitely infiltrated, also appears on the face and scalp, palms and soles. The lesions of parapsoriasis, not infiltrated, are superficial in character. Such areas of the skin as the face, scalp, palms and soles are as a rule, devoid of lesions. Further, in syphilis a history of infection in the mother may be elicited, the blood serologic tests of both the mother and child will give positive results and specific therapy will cause the lesions to involute.

The macular circinate scales of *pityriasis rosea* may be mistaken for parapsoriasis. But the lesions of pityriasis rosea are only slightly reddish or pink, whereas lesions of parapsoriasis are yellowish-brown or a darker red. Upon close examination of the macular lesions of pityriasis rosea, the scale will be found free in the center although remaining attached at the periphery. The eruption of pityriasis rosea is preceded by a week or ten days by a herald lesion. This feature is absent in parapsoriasis.

PITYRIASIS LICHENOIDES ET VARIOLIFORMIS ACUTA (MUCHA HABERMANN).—Error in diagnosis of this form of pityriasis may occur particularly when the vesicles are large and resemble those of *varicella*. In varicella often a history of contact may be elicited, also, constitutional symptoms including elevation of temperature, are usually present. Constitutional symptoms are mild or absent in pityriasis lichenoides et varioliformis acuta. Too general adenopathy is more marked and more constant in varicella than in pityriasis lichenoides. The papulonecrotic lesions in pityriasis lichenoides are definitely inflammatory; they are noninflammatory in varicella.

Prognosis.—Once the disease is diagnosed, it may be expected to be persistent, even life-long. Spontaneous remissions have been reported in a few cases, but this outcome is rare. In general it might be said that the disease is most recalcitrant both to internal and topical therapy. Remissions and exacerbations are not uncommon in the guttate type. The duration of the disease is from one to six months, though in some cases it has lasted as long as two years.

Treatment.—There are no known specific agents for this disease. Some investigators have found good results following generalized exposure to ultraviolet light. Arsenic in the form of sodium cacodylate has been suggested either alone or preferably combined with exposure to ultraviolet light. Children tolerate arsenicals well. Presumably, the arsenic is to be considered as a sensitizer to light. Canizares feels that calciferol is definitely beneficial in the treatment of *parapsoriasis guttata* and *pityriasis lichenoides et varioliformis acuta*. Four of Canizares' patients, all children with the guttate type, were given vitamin D_2. Two of this number who received 50 000 units daily, one child for three months and the other for six weeks, showed definite clinical improvement. On the other hand, the two youngest children, aged 2 and 3½ years respectively, received doses of 30 000 units and 20 000 units daily for one month without benefit.*

---

* When vitamin D_2 is given over prolonged periods of time the physician should be on guard for evidence of toxicity. These may include thirst, anorexia, nausea, vomiting, tiredness, malaise, abdominal pain, headache, constipation, polyuria, albuminuria, loss in weight, excitability and photophobia. Any of these signs and symptoms should call for a blood serum calcium determination especially for diffusible serum calcium which is greatly increased above normal.

Lichen Planus

Lichen planus is an inflammatory disease of the skin and mucous membrane that only rarely occurs in infants and children. It appears initially as a nonscaly shiny flat-topped, polygonal papule about the size of a pinhead, slightly elevated above the skin surface and of a reddish purple or lavender color. Some papules may be umbilicated and present white lines or puncta running over them, the so-called "Wickham striae. The violet color is so characteristic of this disease that often a diagnosis may be made on this factor alone. Frequently the papules grow larger and coalesce to form irregular plaques consisting of large, round, oval-shaped lesions covered by a fine adherent scale. See Figure 50

It occurs usually on the inner aspects of the thighs, ankles, the flexor surfaces of the wrist, the forearms (Fig. 51) and the sacral area. In about 25 per cent of cases the lesions occur on the mucous membranes, particularly those of the oral cavity. It may appear as an acute generalized lesion, in which case it resembles an exanthematous condition, or it may be chronic and localized. The condition is accompanied by pruritus.

This disease should be regarded as a constitutional disease of unknown etiology although some investigators believe that it is due to a constitutional derangement which in turn is activated by infectious agents. There are seldom if ever complications and the prognosis is good.

Diseases that cause diagnostic uncertainty and the differential characteristics are the following. I scabies there will be found a burrow the mite and its ova. Response to antiscabetic therapy is prompt and others in the family will be affected. In *pediculosis corporis* papules and scratch marks will be found in the interscapular area. I *pityriasis rosea* the oval-shaped pink lesions with cigarette-paper-like scale are characteristic. In *dermatitis medicamentosa* from heavy metals and other *drug eruptions* a history of ingestion of certain drugs will be elicited. In *pityriasis lichenoides et varioliformis acuta* the exanthem is characterized by the sudden appearance of a nonpruritic polymorphous eruption consisting of macules, papules and sometimes vesicles (varicelliform) also papulonecrotic lesions and crusts and hemorrhagic excoriations leaving smooth, depressed, varioliform scars. The mucous membranes are not involved. In the *lichenoid syphilid* there is no itching and blood serologic tests will clear up any doubt. *Lichen scrofulosorum* occurs in tuberculous children. The rash appears in showers. The small, often flat-topped and scaly papules are grouped in patches and do not show Wickham striae. In *lichen spinulosus* the eruption is arranged symmetrically and there are characteristic horny spicules. In *keratosis pilaris* the lesions are horny follicular papules, slightly gray or even the color of normal skin. In *lichen urticarius* the extensor surfaces rather than the flexors of the extremities may be affected and the lesions are of shorter duration. In *miliaria rubra* the lesions consist of minute inflammatory papules and vesicles at the sweat pores.

In differentiating localized lichen planus *neurodermatitis* must be thought of. In the latter however the white streaks will be absent and the papules may be globular and less shiny

Lichen planus of the mucous membranes can be distinguished from *moniliasis* by mycologic examination.

Treatment.—A complete physical examination should be carried out as a routine measure with particular attention directed to possible foci of infection such as diseased teeth, tonsils and sinuses. The best therapy undoubtedly is the administration of arsenic in the form of Fowler's solution. The dosage, initially one drop diluted in fruit juice administered three times daily should be gradually increased to the point of tolerance and then discontinued. Other popular remedies are mercurials, bismuth, subsalicylate and crude liver extract.

Roentgen ray therapy is a generally accepted method for treating this condition and, if properly carried out, may be employed for both the acute and chronic types. It is my opinion, however that the use of x-ray therapy should be restricted to resistant cases.

For the relief of the pruritus several lotions and ointments are effective, particularly those containing phenol. The tars may also be used either as a lotion or as a bath. Antihistamines per os should be tried in recalcitrant cases.

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Prognosis.—Once the disease is diagnosed, it may be expected to be persistent, even life-long. Spontaneous remissions have been reported in a few cases but this outcome is rare. In general it might be said that the disease is most recalcitrant both to internal and topical therapy Remissions and exacerbations are not uncommon in the guttate type. The duration of the disease is from one to six months though in some cases it has lasted as long as two years.

Treatment—There are no known *specific* agents for this disease Some investigators have found good results following generalized exposure to ultraviolet light. Arsenic in the form of sodium cacodylate has been suggested either alone or preferably combined with exposure to ultraviolet light. Children tolerate arsenicals well Presumably the arsenic is to be considered as a sensitizer to light. Canizares feels that calciferol is definitely beneficial in the treatment of *parapsoriasis guttata* and *pityriasis lichenoides et varioliformis acuta* Four of Canizares patients all children with the guttate type, were given vitamin D_2. Two of this number who received 50 000 units daily one child for three months and the other for six weeks, showed definite clinical improvement On the other hand, the two youngest children aged 2 and 3½ years respectively received doses of 10 000 units and 20,000 units daily for one month without benefit.*

* When vitamin D_2 is given over prolonged periods t a time the physician should be on guard for evidence of toxicity These may include thirst, anorexia, nausea, vomiting, tiredness, malaise, abdominal pain, headache, constipation polyuria, albuminuria, loss in weight, excitability and photophobia. Any of these signs and symptoms should call for blood serum calcium determination especially for diffusible serum calcium which is greatly increased above normal.

Pityriasis Rubra Pilaris
(Lichen Ruber Lichen Ruber Acuminatus)

Pityriasis rubra pilaris is a chronic skin disease characterized by small follicular papules and disseminated, yellowish-pink scaling patches.

Etiology.—The cause is unknown although relation between deficient utilization of vitamin A and pityriasis rubra pilaris has been established during the last few years. According to Kierland and Kulwin there are two distinct types the familial type, which has its onset in infancy and childhood, and the acquired type which has its inception in middle age and shows no genetic relations. In many cases it seems that infectious diseases or infections, such as measles, scarlet fever mumps, and tonsillitis, serve as precipitating factors.

Clinical Picture.—The symptomatology is described by the term "pityriasis rubra pilaris," in which "pityriasis" refers to scale, "rubra" to redness, and "pilaris" to the follicular lesions (Fig. 52, *A*) The primary lesion occurs at the follicular openings (pilares) and examination of the affected areas of the skin soon confirms this observation. There is definite follicular hyperkeratosis, the follicular element, appearing acuminate (i.e., cone-like) is whitish or grayish and then becomes red. The lesions are mostly discrete, but at times they may be confluent and they are localized at the hair follicles. Many of the lesions are pierced by hairs, which may have already been broken off, showing a dark point, when the patient is first seen. Another feature is the scale. If the hyperkeratotic areas are scratched and the scale is removed the base of the lesion may then appear umbilicated like the polygonal lesion of lichen planus. The confluence of several primary lesions results in larger patches which appear as branlike scales. In some areas, such as the palms and soles, the plaques may be of several thicknesses, very adherent and removed with difficulty. Such solid hyperkeratotic masses have been compared to plaster of paris and, because of their granitelike hardness, have been referred to by the French dermatologists as "plaque granite." When they affect the face and neck, the facial expression becomes characteristic so that a diagnosis of the disorder may be made upon mere inspection. In more advanced cases the eyelids may become distorted, resulting in ectropion. The redness, first noticed in the follicular papules, may become generalized. The eruption is usually symmetrically distributed on the face, arms and legs. The follicular characteristic is particularly noticeable on the dorsal aspects of the middle and proximal phalanges indeed, it is on these areas that the earliest manifestations of the disease are usually first noticed Nevertheless, any part of the skin may be affected. The alabaster-like hyperkeratotic plaques on the soles have been described as keratodermic sandals (Fig. 52, *B*) The scalp may be covered with scales although in most instances it is free from lesions. An associated alopecia is sometimes found. The nails may be the seat of subungual keratosis and show numerous striations, but this condition is not characteristic. The characteristic feature of nail involvement is distortion of the nail itself downward and sideways. The mucous membranes are seldom involved, and for them there are no characteristic lesions. The disorder is asymptomatic, although some patients complain of itching.

Diagnosis.—In a classical case, diagnosis is simple, but the early clinical picture may be mistaken for psoriasis, seborrheic dermatitis or lichen planus. The most important single diagnostic feature is the more or less acuminate papules, which are reddish-brown, pinhead size and topped by a central horny plug. The skin, which looks like goose-flesh, feels like the surface of a nutmeg grater Upon closer inspection an imbedded hair or part of one, may be found in the horny center When pityriasis rubra pilaris is suspected, lesions should be looked for first on the face, the sides of the neck, the dorsal aspects of the fingers and, finally the palms and soles which should be inspected for hyperkeratotic plaques. Areas of normal skin are frequently seen between plaques of the disease.

Differential Diagnosis.—Pityriasis rubra pilaris should be differentiated from psoriasis, lichen planus, ichthyosis, congenital hyperkeratosis (vitamin A deficiency) The diagnostic features of these diseases are discussed under their separate headings in other parts of this chapter

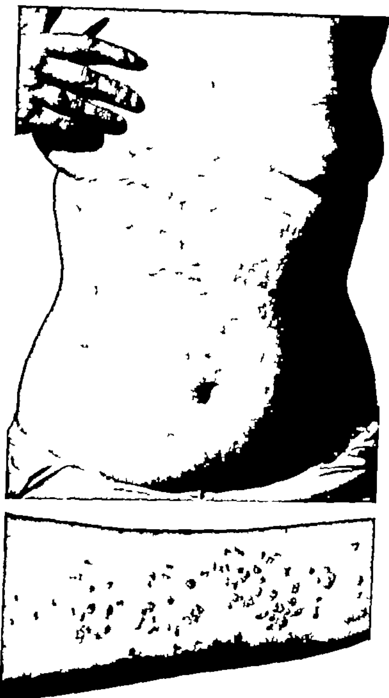


Fig 50 (top).—Lichen planus. Classical picture in an adolescent showing typcial polygonal lesions, Koebner phenomenon and violaceous appearance of the rash (Courtesy of Dr Carroll S. Wright and Dr J P Guequierre)

Fig 51 (bottom) —*Lichen planus. Violaceous polygonal papules on the flexor surface of the ex tremity* Duration three months.

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Etiology.—The cause is unknown although a relation between deficient utilization of vitamin A and pityriasis rubra pilaris has been established during the last few years. According to Kierland and Kulwin there are two distinct types: the familial type, which has its onset in infancy and childhood; and the acquired type which has its inception in middle age and shows no genetic relations. In many cases it seems that infectious diseases or infections, such as measles, scarlet fever, mumps, and tonsillitis, serve as precipitating factors.

Clinical Picture.—The symptomatology is described by the term "pityriasis rubra pilaris," in which "pityriasis" refers to scale, "rubra" to redness, and "pilaris" to the follicular lesions (Fig. 52, *A*). The primary lesion occurs at the follicular openings (pilares) and examination of the affected areas of the skin soon confirms this observation. There is a definite follicular hyperkeratosis, the follicular element, appearing acuminate (i.e., cone-like), is whitish or grayish and then becomes red. The lesions are mostly discrete, but at times they may be confluent and they are localized at the hair follicles. Many of the lesions are pierced by hairs, which may have already been broken off, showing a dark point, when the patient is first seen. Another feature is the scale. If the hyperkeratotic areas are scratched and the scale is removed, the base of the lesion may then appear umbilicated like the polygonal lesion of lichen planus. The confluence of several primary lesions results in larger patches which appear as branlike scales. In some areas, such as the palms and soles, the plaques may be of several thicknesses, very adherent and removed with difficulty. Such solid hyperkeratotic masses have been compared to plaster of paris and, because of their granite-like hardness, have been referred to by the French dermatologists as "plaque granite." When they affect the face and neck, the facial expression becomes characteristic so that a diagnosis of the disorder may be made upon mere inspection. In more advanced cases the eyelids may become distorted, resulting in ectropion. The redness, first noticed in the follicular papules, may become generalized. The eruption is usually symmetrically distributed on the face, arms and legs. The follicular characteristic is particularly noticeable on the dorsal aspects of the middle and proximal phalanges; indeed it is on these areas that the earliest manifestations of the disease are usually first noticed. Nevertheless, any part of the skin may be affected. The alabaster-like hyperkeratotic plaques on the soles have been described as keratodermic sandals (Fig. 52, *B*). The scalp may be covered with scales although in most instances it is free from lesions. An associated alopecia is sometimes found. The nails may be the seat of subungual keratosis and show numerous striations, but this condition is not characteristic. The characteristic feature of nail involvement is distortion *of the nail itself* downward and sideways. The mucous membranes are seldom involved, and for them there are no characteristic lesions. The disorder is asymptomatic, although some patients complain of itching.

Diagnosis.—In a classical case, diagnosis is simple, but the early clinical picture may be mistaken for psoriasis, seborrheic dermatitis or lichen planus. The most important single diagnostic feature is the more or less acuminate papules, which are reddish-brown, pinhead size and topped by a central horny plug. The skin, which looks like goose-flesh, feels like the surface of a nutmeg grater. Upon closer inspection an imbedded hair, or part of one, may be found in the horny center. When pityriasis rubra pilaris is suspected, lesions should be looked for first on the face, the sides of the neck, the dorsal aspects of the fingers and, finally, the palms and soles, which should be inspected for hyperkeratotic plaques. Areas of normal skin are frequently seen between plaques of the disease.

Differential Diagnosis.—Pityriasis rubra pilaris should be differentiated from psoriasis, lichen planus, ichthyosis, congenital hyperkeratosis (vitamin A deficiency). The diagnostic features of these diseases are discussed under their separate headings in other parts of this chapter.



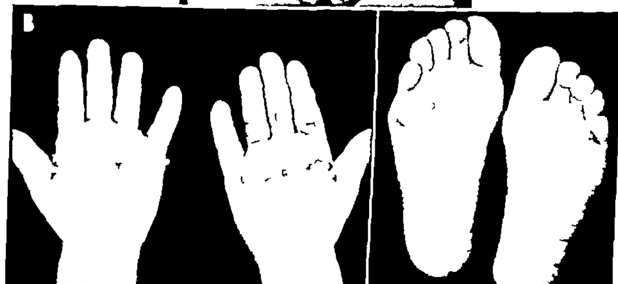


Fig 52.—A, Pityriasis rubra pilaris. Photograph taken 6 weeks after the rash was first noticed. Note that many of the lesions bear a strong resemblance to those of lichen planus. The Koebner phenomenon can be seen on the abdomen below the umbilicus. B Pityriasis rubra pilaris. Lesions on the palms and soles of a boy 6 years of age. Note the marked thickening of the skin of the palms, which were a deep-seated rather dark red color over which the superficial layers were distinctly yellow The surfaces were hard and rough and there was some irregular exfoliation (By permission from Webster J R and Fall, A B A.M.A Arch Dermat and Syph 65 685-698 June 1952.)



Fig. 53.—Lichen nitidus of six months duration in a boy 3½ years of age. Shiny minute papules were distributed on the flexor surfaces of both arms and forearms and on the shaft of the penis. They were nonpruritic. Several lesions follow linear distribution, the Koebner phenomenon.

Treatment.—The use of vitamin A provides the best therapy. It should be administered orally in amounts of from 100,000 to 200,000 units daily. If this is ineffective, intramuscular administration should be tried. Starch baths or oatmeal baths are useful, as also are local applications of olive oil. Salicylic acid ointment has been suggested for keratolytic effect.

See Formulary ℞ 40, for keratolytic ointment, 121 1 to 4 capsules daily depending on age.

Lichen Nitidus

Lichen nitidus (Fig. 53) is a chronic inflammatory disease characterized by the appearance of small pinhead, shiny pink or flesh-colored, flattened, discrete papules, which are grouped and usually localized in the genital areas and in the flexures of the joints. The exact cause is unknown although histopathologic study indicates tuberculoid structure. Some investigators believe lichen nitidus to be a variant of lichen planus. The condition has been reported in both sexes and at various ages. The lesions, which may remain unchanged for years, are usually marked by number of remissions, disappearing in the fall and reappearing in the spring. In some instances there may be complete and spontaneous involution without any recurrence.

Lichen nitidus should be differentiated from verruca planae juvenilis, lichen planus and lichen scrofulosorum (q.v.). There is no specific therapy for this disease although there have been reports of the successful use of intravenous injections of sodium thiosulfate or bismuth. In certain instances fractional doses of roentgen ray therapy have yielded good results. For topical use a mild keratolytic lotion or ointment may be helpful.

See Formulary ℞ 29 35

Lichen Striatus

Lichen striatus is a relatively rare condition which usually occurs in children as a linear lichenoid, papular eruption. The exact cause is unknown. The condition, characterized by a sudden onset, is often discovered quite accidentally by the mother and is seldom preceded by any symptoms. A feature of the eruption is its rapid extension to form linear bands. The bands may be homogeneous, consisting of narrow parallel streaks, or they may be continuous or in-

terrupted by areas of normal skin They vary in length and in width and, as a rule, they occur on the upper extremities On closer examination the linear bands are found to consist of small rounded pinkish yellow infiltrated lichenoid papules, varying in size from a pinpoint to that of a pinhead These papules frequently coalesce to form localized areas of an erythematо-squamous lichenified dermatitis A third and final feature is the spontaneous disappearances of the lesions after several weeks or a *few months without sequelae or atrophy*

Lichen striatus should be differentiated from linear psoriasis lichen planus and linear nevus. These diseases, although simulating lichen striatus, morphologically are not self limiting, are rebellious to therapy and seldom occur on the upper extremities. In cases difficult to diagnose a histopathologic picture can usually settle the issue. As the disease is self limited there is seldom need for therapy It is only when the lesions having been traumatized are accompanied by an associated dermatitis that simple measures, such as a mild astringent ointment or paste, are indicated

See Formulary ℞ 10 39

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13

Chronic Vesicular Bullous Eruptions

THE DISEASES discussed in this chapter generally have three characteristics in common. They are usually chronic or recurrent, the lesions are vesiculobullous and the cause is unknown. The diseases are dermatitis herpetiformis, pemphigus vulgaris and hydroa aestivale. Other diseases characterized by vesiculobullous eruptions such as erythema multiforme bullosum, drug eruptions, impetigo contagiosa and congenital syphilis, are discussed in other chapters.

Dermatitis Herpetiformis

(Duhring's Disease, Dermatitis Multiformis)

Dermatitis herpetiformis is a chronic dermatitis characterized by repeated remissions and relapses. It was first described by Louis Duhring in 1884.

Although no age is exempt, dermatitis herpetiformis is uncommon during infancy and *particularly under 6 years of age. Nevertheless,* Wilson reported an infant who at 3 days of age developed an eruption in which the clinical findings, smears of the vesicular fluid and biopsy were compatible with dermatitis herpetiformis. The exact cause is unknown. Some investigators hold that a filtrable virus is responsible. Others have attributed the disease to an infectious agent and still others have claimed that it is allergic in nature.

Clinical Picture.—The chief elementary lesions are papules and vesicles, and the cardinal signs upon which diagnosis may be based are the vesiculobullous lesions predominating in childhood, which appear quite suddenly (Fig. 54). Erythema, papules, pustules and wheals may also be seen in various combinations and at different times. The classical features in a fully developed case of Duhring's disease include (1) extreme chronicity with partial or complete remission, (2) symmetrical grouping of the lesions in localized areas such as the scapular region, sacrum, buttocks and external genitalia (Fig. 55 *A*) and (3) subjective symptoms of severe burning or an itching sensation preceding the appearance of the rash.

Dermatitis herpetiformis in children differs from the disease seen in adults in that the itching is less severe, the polymorphism is less marked and grouping of the lesions is not so well defined or is absent. Pigmentation as a sequel occurs less frequently than in adults. The *blisters,* thick-walled, vary in size from pinhead to good sized cherry. They may be clear but they soon become purulent and even hemorrhagic. After reaching a larger size they rupture, leaving a denuded, raw-looking surface. While blisters may be located upon the scapular region, external genitalia, sacrum and buttocks, they are frequently found scattered without any grouping, in contrast to their distribution in the adult. The legs, knees and lower aspect of the arms are the sites most frequently affected



Fig. 54.—Dermatitis herpetiformis (Duhring's disease) in a 3 year-old girl. Note the grouped vesicular lesions with crust formation on the outer lip a dry hemorrhagic crust on the lower lip and a plaque of vesicular crusted lesions on the right side of the face and the right lower lip Such lesions have been mistaken for impetigo contagiosa (Courtesy of Mr William J Taylor Department of Photography Temple University School of Medicine.)

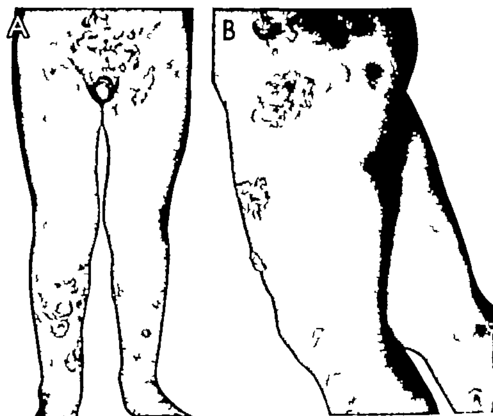


Fig. 55 —Dermatitis herpetiformis (Duhring's disease) In A, note the grouped vesicles on the supra pubic area and the lower extremities In B another patient, the crusted lesions are the result of ruptured vesicles on the thighs and lower extremities. (*A* courtesy of Dr Meyer L. Niedelman. *B* by permission from Dr Chaim Berlin, Tel Aviv Israel J Pediat. 33 609 1948 and Brit. J Dermat. 64 81 290 1952.)

(Fig. 55 *B*). If left untreated, the superficial eroded areas become covered with exudate and crusts. Several closely situated denuded areas frequently join to produce a series of circles, semicircles or gyrate figures. These may become impetiginized. In addition to the vesicles, ruptured and unruptured, one almost invariably finds numerous infiltrated papules and an associated erythema. Ordinarily the mucous membranes of the mouth and other organs remain free of vesicles, in fact, the absence of vesicles from the mucous membranes has been advanced as a diagnostic sign in favor of dermatitis herpetiformis. However some investigators have reported instances of bullae on the mucous membranes of the mouth.

Pigmented pinkish brown spots generally occur *late in the* course of the disease. Pigmentation is particularly diagnostic of Duhring's disease when seen in the lumbar and sacral areas. *An interesting feature is the eosinophilia, which is generally increased during acute episodes and which subsides as the acute inflammatory reaction of the skin improves. Smears from the* vesicular content will show polymorphonuclear leukocytes, the majority of them eosinophils. Eosinophils are also characteristic and they predominate in the bullae upon histopathologic examination.

The onset of the eruption is sudden. Prodromal symptoms of malaise, slight fever irritability sleeplessness, loss of appetite and vomiting, have been noted.

Diagnosis.—In typical cases the diagnosis is easily made although in children the classical picture is not always present. The cardinal features are the polymorphism of the eruption, severe pruritus, residual pigmentation, chronicity (that is, long duration with tendency for recurrences and remission) eosinophilia in the blood and in the vesicular fluid, hypersensitivity to halogens (iodides and bromides) response to sulfonamides, particularly sulfapyridine, and a good state of nutrition. The diagnosis of dermatitis herpetiformis in children is sometimes attended with considerable difficulty

Dermatoses particularly apt to be confused with dermatitis herpetiformis include dermatitis medicamentosa, epidermolysis bullosa hereditaria, atypical forms of urticaria and chronic eczemas, pemphigus vulgaris, erythema multiforme, bullous impetigo contagiosa, impetigo of the newborn, lichen planus bullosum scabies, prickly heat and the bullous syphilid (rare) However careful study of the characteristic lesions and their distribution will serve to differentiate them.

Complications and Prognosis.—Secondary infection (pyoderma) is not uncommonly seen as part of the clinical picture.

The prognosis seems to be better for children than for adults. Because dermatitis herpetiformis is a chronic disease, spontaneous remissions are the rule In children, recurrences are milder and less frequent than in adults. *During the* course of the disease good appetite and good nutrition is sustained and the children appear to be in good health.

Treatment.—The remedies of choice are the sulfonamides, Pyribenzamine and Aureomycin. Of the sulfonamides, those containing the *pyrrole ring* seem particularly useful both for relief of pruritus and for involution of lesions.

Sulfapyridine is apparently the most effective *of the sulfonamides. Children should receive* dosage based on their body weight. For children 10 years and over the initial dose should be 0.5 Gm. three times daily and an average maintenance dose is 0.25 Gm. three times daily Daily urinalyses and complete blood count should be carried out routinely at frequent intervals during treatment.

Good results from Fowler's solution have been reported after other remedies had failed, a girl 3 years of age showed improvement after treatment for 10 days. The initial dose is 1 minim (0.06 cc.) increasing to 3 minims (0.18 cc.) three times daily or even as high as 9 minims (0.54 cc.) three times daily Generally infants and children tolerate arsenicals well. The dose may be continued for several weeks at time provided that frequent urinalyses are carried out concurrently Autohemotherapy has been advocated by some investigators who have obtained good results.

Procaine penicillin, 300,000 units (aqueous solution) may be administered intramuscularly once daily for several days. It has no specific effect on the disease itself but it is valuable as a protection against secondary infection.

Generalized exposures of ultraviolet from a mercury vapor quartz light also have been recommended.

For local therapy colloidal starch baths or oatmeal baths such as Aveeno are soothing and allay inflammation Potassium permanganate baths in concentration from 1 10 000 to 1 20 000 are useful when the clinical picture is complicated by secondary infection. Duhring advised the use of a 5 to 10 per cent sulfur ointment Ammoniated mercury ointment in 2 to 3 per cent strength is also useful for pyoderma

Representative Prescription

℞

Menthol	0 4
Phenol	2.4
Chloral hydrate	12.0
Calamine lotion q s. ad	240 0

Misce et fiat lotio
Signa Sop on for itching
Indication Local antipruritic

(J L. Callaway)

℞

Precipitated sulfur (2-4%)	2.4-4.8
Zinc oxide paste q s. ad	120 0

Misce et fiat pasta
Signa Apply freely
Indication For dry skin

(Sobye)

See Formulary ℞ 11 22 antipruritics, 70 antiphlogistic.

Pemphigus Vulgaris

(Juvenile Pemphigus)

The term pemphigus the Latin word meaning "blister applies to a group of relapsing bullous affections that are at times associated with constitutional symptoms and are usually fatal The term pemphigoid refers to those bullous eruptions that are not actually pemphigus but resemble it The varieties of pemphigus have been classified as (1) pemphigus acutus (2) pemphigus vulgaris, (3) pemphigus foliaceus, and (4) pemphigus vegetans. Pemphigus vulgaris is also referred to as malignant (acute type) and chronic.

Etiology.—Th cause is obscure although various bacteria have been incriminated for acute pemphigus. Sonneman reported four cases of acute febrile pemphigus in infants in which a culture of the bullae and blood disclosed hemolytic staphylococci. Acute pemphigus may follow vaccination and has also been seen in persons handling animal products, these relationships strongly suggest bacterial infection. A neurotrophic virus is also held responsible because frequently symptoms are referred to the central nervous system. Other investigators have suggested a toxic agent operating with morbid results upon the skin.

Pemphigus is relatively rare in children, and it occurs extremely rarely in more than one member of the same family Of 603 cases of pemphigus vulgaris gathered by Belk from the literature, 6 per cent occurred in the 4–14 years age group of 137 cases of pemphigus vegetans, 2 per cent occurred in the same age group of 97 cases of pemphigus exfoliativus, 1 per cent occurred in the same age group

Clinical Picture.—The acute type is the common one in children. Vesicles (bullae) are probably the first sign to be noticed by parents and to lead them to seek medical advice. At first the vesicles are small and as a rule generalized. They may appear in an irregular manner first upon the trunk and later upon the mucous membrane of the mouth or perhaps upon the mucous membranes of other organs, the conjunctivae vaginal mucosa nostrils, etc. In severe cases the entire buccal mucous membrane may be stripped off leaving a raw surface. Large blebs may also be found on the conjunctivae. New lesions continue to form after a while, and as these occur the older lesions become larger The vesiculobullous eruption may be discrete while the vesicles themselves are flaccid confluent, thick walled and tense and filled with a seropurulent noninflammatory serum Some of the vesicles and bullae may be hemorrhagic. Older lesions may be covered with a thick brownish crust Any part of the body may be affected, the areas of predilection being the trunk arms and legs. It would seem that the vesicles and bullae appear in particularly great number around the abdomen, pubic region and upper parts of the extensor surfaces of the thighs. On the other hand, the scalp may show comparatively few lesions. The vesicles vary in size from that of a pea to a bean and, after rupturing, may present large raw moist surfaces. A fetid odor is said to be of diagnostic importance.

Nikolsky's sign may be present although it is

not specific sign for pemphigus. The sign consists of a stripping of the epidermis by a gentle stroking of the skin with blunt-pointed object such as tongue depressor

Healing occurs without any residual pigmentation and without scar formation. Nutrition is well preserved in the beginning or there may be a slight loss of weight. However nutrition soon suffers and loss of weight occurs as the disease progresses. Irritability lassitude, loss of appetite and a mild pruritus may be present. Usually there is low-grade fever

Diagnosis.—Rothman states that true pemphigus occurs so rarely in children that a diagnosis of it should always be looked upon with suspicion. The cardinal diagnostic signs are (1) the sudden appearance of tense bullae upon a normal skin; (2) involvement of the buccal mucosa and other mucous membranes, (3) irregularity of appearance of bullae, with no sites of predilection; (4) lack of polymorphism, (5) healing without cutaneous residuals, (6) unremitting course and constitutional symptoms. Biopsy is often necessary to settle the diagnosis. Since some recoveries have been reported among children, the usually fatal outcome is no criterion. The differential diagnosis involves the consideration of those diseases characterized by vesiculobullous lesions, dermatitis herpetiformis, erythema multiforme bullosum, drug eruptions, particularly from the iodides, hydroa aestivale, epidermolysis bullosa hereditaria, bullous impetigo contagiosa and, in very young infants, congenital syphilis. The history the cardinal diagnostic signs of pemphigus, and, if necessary serologic tests and biopsy will clear up any diagnostic doubt.

Special Varieties of Pemphigus

Pemphigus foliaceus.—Pemphigus foliaceus is uncommon in children. Hasselmann and May reported the first case of pemphigus vulgaris vegetans et foliaceus in a Japanese infant, age 1½ years in the tropics. The essential signs in pemphigus foliaceus consist of poorly developed, flaccid bullae, which rupture. Rupture is followed by general exfoliation. Nikolsky' sign is positive and fever is present. Death results from intercurrent infection and gastrointestinal disturbances.

Pemphigus vegetans.—Pemphigus vegetans also begins with bullae, which, after rupturing leave raw surfaces. Later fungoid growths follow These may occur upon the mucous membranes of the mouth or in the folds, such as the axillae and groins. This form of pemphigus is rarely seen in children.

Chronic pemphigus.—In chronic pemphigus the acute signs abate and merge into a subacute or chronic type, which may last many months or years. It is characterized by relapses and recurrences. The nutrition is surprisingly well maintained.

Complications and Prognosis.—Secondary infection is not uncommon sepsis has been recorded. Bronchopneumonia and cardiorenal failure have been observed.

Until recently pemphigus was regarded as fatal. However the introduction of adrenocorticotropin hormone (ACTH) and cortisone has changed the entire outlook on the disease. It is difficult to state with exactness the final outcome for children because many of the cases reported have been *pemphigoid* rather than true pemphigus and in many instances biopsy reports have not been carried out. Furthermore, because pemphigus is seen with comparative rarity the accumulation of any large series of patients has not been possible

Treatment.—ACTH and cortisone.—Cortisone I dose of 30 mg. daily (or more, depending on the age and weight of the child) yields spectacular results in causing the lesions to disappear However the drug is of only temporary value, for the lesions recur as soon as it is discontinued. ACTH in doses of 40 mg. daily (10 mg. every 6 hours intramuscularly) is equally effective.

Optimal dosage for ACTH and cortisone in children from infancy through adolescence is determined primarily by the severity of the disease *rather than* by the age and weight of the patient. As a practical rule initial dosage for children should not be less than half the initial daily requirement of adults. Thus an infant or child of preschool age may well require HP Acthar Gel in doses f 40 to 80 Armour units in divided doses on the first day Thereafter the dosage must be carefully individualized with respect to clinical response and the occurrence or lack of side reactions. According to Lever in

Generalized exposures of ultraviolet from a mercury vapor quartz light also have been recommended.

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Representative Prescription

℞

Menthol	0.4
Phenol	.4
Chloral hydrate	12.0
Calamine lotion q.s. ad	40 0
Misce et fiat lotio	
Signa Sop on for itching	
Indication Local antipruritic	
	(*J L. Callaway*)

℞

Precipitated sulfur (2-4%)	4-4.8
Zinc oxide paste q.s. ad	120 0
Misce et fiat pasta	
Signa Apply freely	
Indicatio For dry skin	
	(Sөbye)

See Formulary ℞ 11 22 antipruritics, 70 antiphlogistic.

Pemphigus Vulgaris

(Juvenile Pemphigus)

The term "pemphigus," the Latin word meaning "blister applies to a group of relapsing bullous affections that are at times associated with constitutional symptoms and are usually fatal The term "pemphigoid" refers to those bullous eruptions that are not actually pemphigus but resemble it. The varieties of pemphigus have been classified as (1) pemphigus acutus, (2) pemphigus vulgaris (3) pemphigus foliaceus, and (4) pemphigus vegetans Pemphigus vulgaris is also referred to as malignant (acute type) and chronic.

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Nikolsky's sign may be present although it is



Fig. 57.—Hydroa vacciniforme in boy 9 years of age. (By permission from Zarafonetis, C. J. D. et al.: J. Invest. Dermat. vol. 1, July 1953.)

Hydroa Aestivale

(Recurrent Summer Eruption, Hydroa Vacciniforme)

The term "hydroa," derived from the Greek word meaning egg, refers to the appearance of the lesions. The disease is recurring vesiculobullous eruption which occurs mostly during the summer months, generally in children, and which often terminates in scars. It usually but not invariably appears on the exposed surfaces of the skin. Bazin in 1861 first described its clinical manifestations.

According to Senear and Fink cases may be grouped on the basis f the cutaneous lesions into (1) mild types (*hydroa aestivale summer prurigo of Hutchinson*) characterized by papules or small vesicles in which the cellular reaction is insufficient to produce scar formation (Fig. 56) and (2) severe types (*hydroa vacciniforme*) characterized by an eruption consisting of bullae, crusts and pitted scars (Fig. 57). The distinguishing feature in these latter cases is scar formation. I addition, condition known as *hydroa puerorum* has been described which occurs very early in life and is believed by many to be mild form of hydroa aestivale.

Etiology.—The cause of the disease is unknown. It is seen in both sexes but more frequently affects males, especially young males. Cases have been reported among dark-skinned persons, particularly children from South America, Italy and even Japan. Heredity seems occasionally to play a part, for the disease has been reported among brothers and sisters. Because it is seen most commonly in the summer season, it is generally believed that strong precipitating or contributing factors in some manner relate to exposure to the sun and wind, that so-called "photosensitization," with the appearance of porphyrinuria is responsible. However according to Mason et al., hydroa vacciniforme can occur without any increased excretion of porphyrin, nor conversely does porphyria always produce photosensitivity.

Hematoporphyrin, an iron-free derivative of hemoglobin, is sensitizer to ultraviolet. Zeligman found that children excreted 0.6 to 3 mg. (an average of 2.1 mg.) in 24 hours per kg. of body weight.

the treatment of pemphigus ACTH and cortisone must be given to infants and children in fairly high doses in comparison with weight. He states that in infancy one would give one half of the adult dose in the pre-school years up to age 10 three-fourths of the adult dose and after that age the adult dose Because the response to these drugs varies considerably he believes that trying a smaller dose first is entirely worthwhile. He recalls that in one infant with bullous pemphigoid (subepidermal bulla) aged 18 months a dose of 150 mg of cortisone was necessary to suppress the eruption However he did not give such a high dose for more than a few days but was satisfied to ameliorate the eruption with the dose varying from 75 to 100 mg. In general, the corticosteroids have changed the outlook in pemphigus.

SULFONAMIDES AND ANTIBIOTICS.—Sulfadiazine in doses of 0 32 Gm. (5 gr) should be given every four hours by mouth. Or intramuscular injections of procaine penicillin (aqueous) may be given in doses of 300 000 units daily for several days to overcome secondary infection.

TOPICAL THERAPY.—Wet dressings (or baths when there is extensive involvement) consisting of potassium permanganate (1 10 000 to 1 20,000) are most serviceable or moist saline compresses may be used when the lesions are not too extensive. Antiphlogistics, such as colloid baths of starch or oatmeal and the liberal use of unscented talc or starch add to the comfort of the patient Small blood transfusions consisting of 200 cc. of whole blood at weekly intervals or twice weekly also are helpful. Good nutritional states should be maintained.

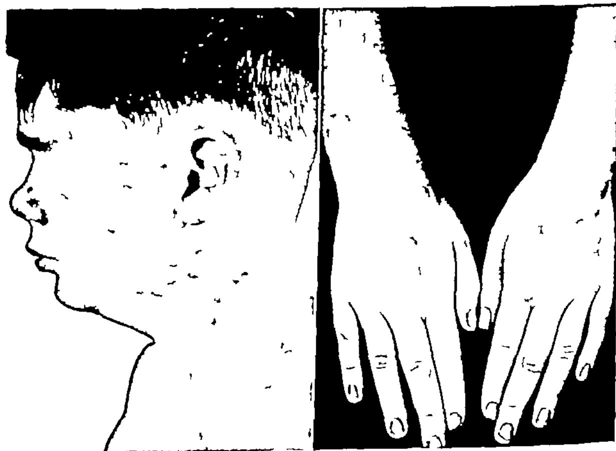


Fig 56.—Hydroa aestivale in a freckled, red haired boy 13 years of age Note the papules and small vesicles distributed on the exposed surfaces of the skin, the face neck dorsal surfaces of hands and forearms and several crusts (impetiginized) on the nose The condition was first noticed four years previously and followed direct exposure to the sun at a school picnic Milder attacks occurred during the winter The mother was auburn-haired and also reacted to the sun.

with seminal insufficiency was treated with pregnant mare's serum for 8 months with satisfactory results.

For topical therapy antiphlogistics in the form of emulsions, ointments and creams are indicated.

Representative Prescriptions

℞

Zinc oxide	30.0
Olive oil	
Calcium hydroxide solution aa q. s. ad	180.0
Misce et fiat emulsion	
Sig.: Apply frequently	
Indication: Antiphlogistic	

See Formulary ℞ 94 95 96, 97 98, 99 100, for sun screens.

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Clinical Picture.—The disease may begin early in life during the first three or four years on the other hand, the clinical manifestations may not become apparent until puberty. The eruption usually appears on the exposed areas of the skin such as the bridge of the nose, the rims of the ears, the forehead, cheeks and other areas of the face and on the extensor surfaces of the forearms and the dorsum of the hands, in a symmetrical distribution. It is characterized by a sudden onset, beginning as erythematous macules with well developed vesicles in 24 hours. The vesicles, frequently resembling herpes rapidly become transformed into bullae. The vesicular content, at first clear becomes turbid then dries up within another three or four days with resultant adherent crusts which fall off after 10 days. Some of the larger vesicles may be surrounded by a red areola with a depressed central scar resembling that of a recent vaccination hence the name "hydroa vacciniforme." Successive crops of new lesions are the rule a completed cycle taking from 2 to 10 days. The episodes may continue for longer intervals in the winter months and for shorter in the summer generally the disease tends to clear up during the winter months and breaks out again in the summer. It is of interest that patients who develop the disease early in life as a rule clear up at the time of puberty. Lesions of the mucous membranes of the mouth such as ulcerative pharyngolaryngitis, have been reported. *Shedding of the nails is said to be a* common symptom. Mackery and Garrod have pointed out that in congenital porphyria and hydroa vacciniforme the teeth are frequently pigmented a coral pink (erythrodontia). Subjective symptoms, which include itching and burning may be slight or entirely absent. The eruption is frequently preceded by a sensation of heat or itching after exposure to the sun.

Diagnosis.—A diagnosis of *hydroa aestivale* (hydroa vacciniforme) is easily made by the appearance of vesiculobullous lesions resembling herpes, limited to the exposed areas of the skin and characterized by crusts and scars. The condition occurs most frequently in young male children. It is worse in the summer better in the winter. These facts will differentiate it from other conditions presenting vesiculobullous involvement dermatitis herpetiformis, erythema multiforme bullosum lupus erythematosus and pemphigus. In difficult cases, histopathologic study may be required.

Complications and Prognosis.—Corneal involvement leaving scars and interfering with vision has frequently been reported. Extensive scarring, in some instances extending from the ears to the nose, may produce an unsightly appearance. Scarring of the lids may lead to ectropion. A severe conjunctivitis may occur alone or in association with keratitis. Constant scratching may result in lichenification. Scars on the scalp may result in various degrees of cicatricial alopecia. Conspicuous deformities of the hands with fixation of the joints and atrophy of the terminal phalanges necessitating amputation also have been reported.

With regard to life, the prognosis is good, but it is poor so far as the prevention of cutaneous scarring is concerned. The condition is a persistent disorder usually continuing until puberty.

Treatment.—Prophylactic measures consist essentially in avoiding exposure to the sun and wind. The use of sun-screens will filter the ultraviolet rays. Many preparations are marketed which serve this purpose. Among them are mentioned PABA quinine derivatives, esculin and dinaphthol sulfonate, which may be employed as lotions, ointments or creams.

Internal therapy has proved unsatisfactory although nicotinic acid has been recommended. Zarafonetis *et al.* however have reported the case of a 9-year-old boy with hydroa vacciniforme who received potassium para aminobenzoate (KPAB) 1 Gm. every three hours for six doses daily. By the fourth day of treatment there was marked improvement of all the lesions. KPAB therapy (6 Gm. daily) was continued at home and he remained free of lesions except for residual scarring for six weeks thereafter. More recently Lain *et al.* reported unusually good results from the use of estrone in the treatment of hydroa vacciniforme in two pre adolescent girls. A total dosage of 800 units was followed by rapid clearing of the skin lesions in both instances. One 18-year-old youth

ith seminal insufficiency was treated with pregnant mare serum for 8 months with satisfactory results.

For topical therapy antiphlogistics in the form of emulsions, ointments and creams are indicated.

Representative Prescriptions

℞

Zinc oxide	30 0
Olive oil	
Calcium hydroxide solution aa q ad	100 0

Misce et fiat emulsum

Signa Apply frequently

Indication Antiphlogistic

See Formulary ℞ 94 95 96, 97 98 99 100, for sun screens.

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4

Diseases Associated with Sclerosis

THE DISEASES associated with sclerosis discussed in this chapter are scleroderma and lichen sclerosus et atrophicus. They have been observed in all ages but their etiology is unknown.

Scleroderma

(Hidebound Skin, Dermatosclerosis)

Scleroderma as defined by Ormsby is a disorder characterized by induration of the skin in localized patches or diffuse areas and frequently associated with atrophy and pigmentation When the fingers are involved it is known as "sclerodactylia."

Its commonest incidence in children is before the second dentition has begun to erupt, with the disorder occurring either before birth or during the first two years of life as "primary scleroderma Cases occurring in later childhood are usually the adult type

Clinically there are three types of scleroderma a diffuse symmetric form a circumscribed type (morphea) and a combined or mixed type. Both the diffuse and localized forms may be seen at the same time

Etiology —The exact etiology is unknown. It is rather uncommon in children. Howard Fox who reviewed the records of about 5800 cases of miscellaneous diseases at the Nursery and Children's Hospital in New York, found only one case of infant scleroderma. A review of about 75 000 skin cases at the Bellevue Hospital Clinic, New York, disclosed only one case of scleroderma in a child, a boy 14 years of age in whom the condition had been present since birth

Scleroderma is more common in females than in males. According to a tabulation by Cockayne of 102 cases in children under 14 years of age collected from the literature, 29.2 per cent were boys, 70 8 per cent were girls. The majority of these patients showed the circumscribed form

Apparently many factors are responsible some of which are precipitating ones. The endocrine glands, the thyroid in particular have been incriminated, based upon a supposition of thyroid disorder Also hypertrophy atrophy sclerosis and a diminution of the iodine content, and adrenal insufficiency have not infrequently been found associated Scleroderma may occur in association with Addison's disease and disturbances of the parathyroids may be contributory It may occur together with a generalized calcinosis or it may follow any severe infection Infectious diseases such as measles, scarlet fever diphtheria, influenza, pneumonia and tonsillitis have been known to precede it. Other cases have been known to follow trauma. Exposure to cold, the rays of the sun and emotional upsets have been cited as predisposing causes. Scleroderma is commonly found associated with Raynaud's disease and occasionally

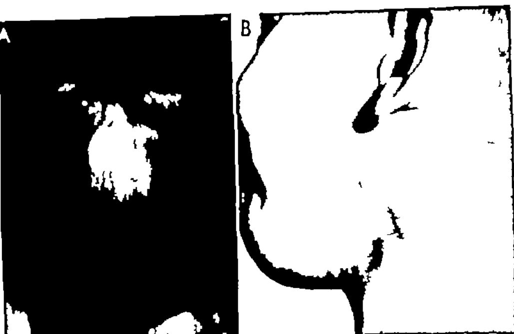


Fig. 58.—A, scleroderma (morphea) of one year's duration following injury in girl 6 years of age. Note the circumscribed area of alopecia. B, localized scleroderma (morphea) of ½ years duration in boy 5 years of age. Note the circumscribed, ivory colored, cartilaginous-like plaque behind and below the left ear continuous on the neck and reaching to the margin of the left mandible. The overlying skin is "hidebound

with thromboangiitis obliterans. Several cases have been reported in which the association of scleroderma with arsenic poisoning was noted. A positive Wassermann reaction has been reported in some scleroderma patients and the scleroderma has improved under antisyphilitic therapy It is generally agreed that scleroderma is an angiotrophoneurosis due to disturbance in either the peripheral or the central nervous system.

Clinical Picture —CIRCUMSCRIBED TYPE OF SCLERODERMA (MORPHEA) —In this type, the lesions appear in the form of one or more discrete circumscribed, yellowish or grayish plaques with violaceous areola (Fig. 58 A) They vary in size from a dime to silver dollar

The lesion may be linear (bandlike) (Fig 58, B) frequently it follows the course of a cutaneous nerve. The skin, definitely firm and hard, cannot be raised from the underlying tissues; it is "hidebound The areas commonly involved include the lower extremities, the head, the face and the breasts. Pigmentation is not uncommon and close inspection of the individual lesions will disclose the presence of telangiectases. The commonest form of scleroderma in childhood is the isolated indurated plaque or band. In children the "coupe de sabre is not uncommonly seen in the scalp In all well-developed cases the lesions are definitely fixed to the subcutaneous and underlying tissues.

GENERALIZED SCLERODERMA.—This is also known as diffuse or progressive scleroderma. The lesions develop insidiously generally starting about the extremities, the face, the neck, and even on the trunk. Sometimes vasomotor phenomena precede the onset of the stiffness of the extremities. In case reported by Cohen occurring in a 13-year-old girl, three years prior to the appearance of the clinical signs the child became abnormally sensitive to cold. The finger tips were involved first, then the toes, and later the hands, feet and nose. On exposure to cold, the fingers and toes quickly turned extremely

white with a tingling followed by pain When *the hands and feet* became warmer they assumed a dusty reddish and purplish tint. A few months later dryness and tightness of the skin appeared and the patient complained of difficulty in performing prehensile movements. The condition grew progressively worse as the involved areas spread from fingers and toes to arms and legs, and from face to chest. The skin becoming smoother firmer and more shiny and acquiring a brownish color developed the clinical picture of sclerodactylia.

The earliest symptom is probably a sensation of stiffness. The affected overlying skin may *show either an infiltration* or a *peculiar edema* Not uncommonly the skin is erythematous and assumes a boardlike rigidity which later becomes hidebound. In well-developed instances the face is characteristic· it is often referred to as "marble statue. Later the affected areas become depigmented and may assume a café-au lait or ivory color· finally they turn brown or bronze especially just before the skin undergoes resolution. The involvement may be localized or it may spread to affect larger areas, even the entire body

The signs and symptoms vary not only with *the extent of involvement but with the particu*lar areas affected. For example, when the disease affects the forehead, there may be interference with wrinkling the skin of the forehead When the area around the eyes is involved there may be difficulty in closing the lids and scleroderma affecting the mouth may interfere with the opening of the mouth and mastication while on the chest, respiratory movements may be interfered with So too scleroderma about *the joints may affect motion.* When the hand and fingers are involved, the picture becomes that of a claw hand (sclerodactylia) Rarely neurologic and arthritic pains and paresthesias may precede the onset of the dermatologic manifestations.

Atrophy and hemiatrophy are features of scleroderma that occur *after the stage of* edema. The stage of edema may last from a few weeks to several months, after which the edematous exudate is absorbed The skin then becomes thin and atrophy becomes evident. Hemiatrophy may affect the face or an entire extremity may become atrophic; indeed, hemiatrophy of the entire body has been reported

Constitutional symptoms sometimes occur in the diffuse type They include fever which is *usually present during the first two weeks* when edema is also present malaise, anorexia and loss of weight. This symptomatology may be followed by involvement of the skin with subsequent contractures the deposition of calcium and atrophic changes.

Diagnosis.—When fully developed, the induration of the skin with its characteristic hidebound appearance renders diagnosis easy Where there is difficulty it usually arises during the early stages. *Sclerema, vitiligo,* Raynaud's disease epidermolysis bullosa and dermatomyositis should be differentiated.

Sclerema is confined to the newborn period and is indeed rarely seen after the first few weeks of life. *Vitiligo* can be distinguished from scleroderma by the fact that the skin may be wrinkled and is never hidebound *Raynaud's disease* is limited to the hands and feet. In *epidermolysis bullosa* the lesions, as a rule, are limited to the extremities and they are localized. In *dermatomyositis* diagnosis must depend on a histopathologic study of the skin.

Complications and Prognosis.—Atrophic changes occur as a sequel to scleroderma. The degree of atrophy will depend on the extent of the involvement and the duration of the disease. Hemiatrophy of an extremity or of the entire side of the body may occur Secondary infection may cause death. In the primary diffuse type in infants the prognosis is good, for these lesions undergo resolution and absorption.

Treatment—Since patients with generalized scleroderma are frequently sensitive to the effects of cold it is important to protect them from inclement weather An effort should be made to build up the patient's resistance by adequate rest and a well balanced diet including vitamins. Precautionary measures against infection should be taken by immunologic prophylactic procedures.

Several forms of therapy have been tried, among them thyroid Artane, the antihistaminics and sympathetic ganglionectomy but none has shown results sufficiently satisfactory to justify use by the pediatrician Massage and

physical therapy are recommended as helpful in improving the circulation and giving symptomatic relief The successful use of the corticosteroids has been reported in some cases of the diffuse progressive type. A trial with this hormone may prove worthwhile in such instances. Zarafonetis (unpublished data) has obtained excellent results with PABA. The dosage and method of administration are described with the treatment of dermatomyositis in Chapter 21

Lichen Sclerosus et Atrophicus
(Hallopeau's Disease)

Lichen sclerosus et atrophicus is a chronic disease characterized by irregular often polygonal, flat-topped papules with atrophy in the advanced stages and marked by keratotic plugs or central "dellng of the lesions.

The disease is uncommon in children, most cases reported having ppeared in middle-aged females.

The cause is unknown. It should be pointed out that Hallopeau's original theory was that lichen sclerosus et atrophicus is a variety f lichen planus, and this view was concurred in by Darier as well as by Wise and Sulzberger McCarthy Laprere and others.

The clinical features are seen around the anogenital region and on the skin. The areas of predilection include the neck, arms, axillae and occasionally the trunk, especially over the clavicular (Fig. 59 4) and sternal areas. Not uncommonly the disease is localized around the vulva and perianal area (Fig. 59 B) but it may appear anywhere.

The primary lesion consists of an achromatic irregular or polygonal flat papule, which is often mistaken for lichen planus. When the lesions are well advanced, the plaques coalesce to form ivory-colored disks of different shapes and sizes. The lesions may be on a level with the normal skin or raised slightly above it. Upon close inspection the typical plaque is found to consist of numerous, tiny comedone-like plugs (keratotic or follicular plugs) scattered throughout the ivory-colored area, but this characteristic appearance is not essential for a clinical diagnosis. Delling of the lesion is another clinical feature, but this sign too is neither always pres-

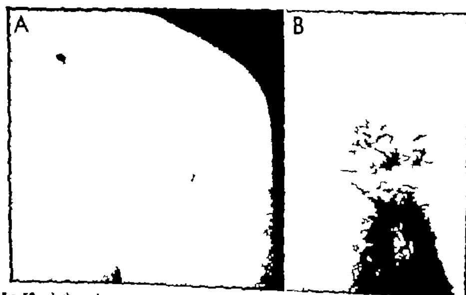


Fig. 59.—Lichen sclerosus et atrophicus in girl 1 years of age. I A, note two chromatic irregular shaped lesions on the left arm Several of the comedo-like plugs can be seen in the upper lesion. Another lesion is over the left lavicle The dark center marks the site of biopsy I B the achromatic, sclerotic plugs (resembling scar tissue) extend posteriorly over the perineum. There is a somewhat fadlike pattern round the anus External genitalia and vulva are uninvolved.

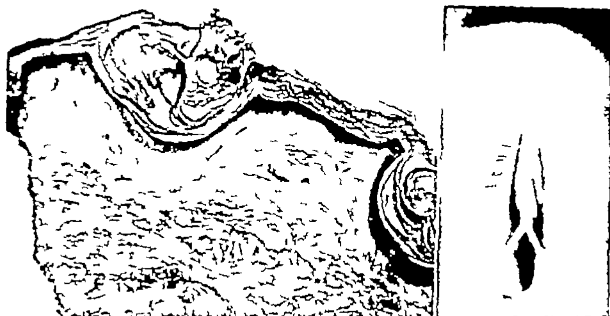


Fig 60 (*left*).—Lichen sclerosus et atrophicus Histopathologic microphotograph shows edema and considerable homogenization of the tissue in the subepidermic region There are a bandlike infiltration of small round cells, wandering connective tissue cells and an occasional plasma cell. The epidermis is thin and flattened. The basal cell margin is washed out. The follicles are dilated and filled with horny material. The elastic tissue is lost beneath the epidermis.

Fig 61 (*right*) —Lichen sclerosus et atrophicus in a 7-month-old infant. (Courtesy of Dr Alfred B Falk.)

ent nor absolutely essential for diagnosis In well advanced cases the lesions may appear atrophic, somewhat like parchment (Fig 60) The vulvar lesions (Fig. 61) consist of bluish or chalk white spots, sometimes papules. Here follicular plugging may not be obvious.

Around the anal orifice the lesion may assume a fan-shaped pattern while the entire vulva may be surrounded on both sides symmetrically A brownish-pigmented border often encircles the lesions. Lesions affecting the mucous membranes of the mouth have been observed in only a few cases. The condition as a rule is asymptomatic, itching and burning sensations being absent. Lichen sclerosus et atrophicus should be differentiated from lichen planus, leukoplakia kraurosis vulvae, and circumscribed scleroderma (morphea)

Superficial ulcerations have been described occurring as complications and these either heal promptly or are persistent and become chronic Telangiectases and purpura have been reported

The tendency of the disease is toward chronicity yet the prognosis is unpredictable and the lesions sometimes undergo spontaneous involution There are no specific remedies.

Striae Distensiae

Striae distensiae (Fig 62) are linear scars that develop in the corium and are seen as red, later blue and finally white, slightly depressed atrophic lines. They are especially noticeable during puberty in overweight boys and girls and after certain diseases. They are asymptomatic and of no practical significance except as a sign of Cushing's disease They also may occur after steroid therapy

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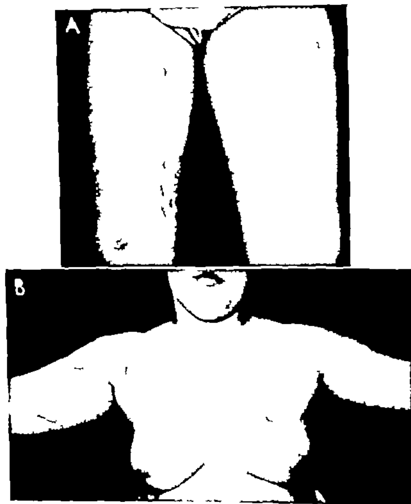


Fig. 62.—Striae distensae. A, on the thighs in girl 9 years of age who was 16½ lb overweight. They were first noticed when the child was 1 year old. B In girl 12 years of age who was 33 lb over eight.

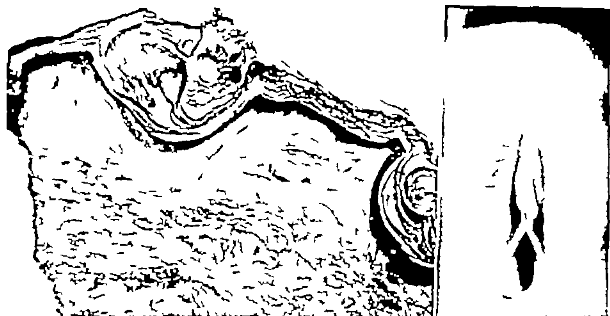


Fig. 60 (left).—Lichen sclerosus et atrophicus Histopathologic microphotograph shows edema and considerable homogenization of the tissue in the subepidermic region There are a bandlike infiltration of small round cells, wandering connective tissue cells and an occasional plasma cell. The epidermis is thin and flattened. The basal cell margin is washed out. The follicles are dilated and filled with horny material. The elastic tissue is lost beneath the epidermis.

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Striae Distensiae

Striae distensiae (Fig 6?) are linear scars that develop in the corium and are seen as red, later blue and finally white, slightly depressed atrophic lines. They are especially noticeable during puberty in overweight boys and girls and after certain diseases, They are asymptomatic and of no practical significance except as a sign of Cushing's disease. They also may occur after steroid therapy

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tend to achieve an equilibrium and whenever this equilibrium is disturbed, corresponding forces seem to be initiated which tend to restore it. After reduction, the re-establishment of the resident bacteria appears to proceed at a rate represented in a general sigmoid curve, as is true of bacteria grown in cultures. Hands and arms thoroughly degermed may require week or more for the complete restoration of their normal flora, but it will be achieved.

On the other hand, there is evidence suggesting that it is possible for transients, under certain circumstances, to become established as residents. Although there is wide disagreement over the nature and extent of the potentially pathogenic bacteria found on the normal skin, it is apparent that many individuals do harbor organisms which, by the criteria of standard laboratory tests, are capable of causing lesions if once the body defense is reached. For example, of the gram positive pyogenic cocci, the group of organisms consisting of staphylococcus, streptococcus and pneumococcus, the staphylococcus is the dominant organism of the normal skin. (Most authors accept the coagulase test as establishing pathogenicity) Further investigators have shown that the hemolytic morphologic variants of the staphylococcus aureus, commonly called staphylococcus albus, have mistakenly been considered non-pathogenic. Among the most commonly encountered species of staphylococcus, the S. aureus, S. albus and S. citreus, the most offending is the Staphylococcus aureus as responsible for most of the pyodermic skin infections seen in children, including acne, boils, furunculosis and carbuncles. Occasionally a mixture of the S. aureus and albus may be found, although the S. albus is more frequently to be found in acne pustules together with the acne bacillus (corynebacterium acnes) In conclusion, strong statistical evidence suggests that the presumably pathogenic staphylococci found on the skin ar true residents there, capable of maintaining themselves indefinitely in an environment entirely favorable for their growth and reproduction.

Conversely the relation of β-hemolytic strains of streptococci both to diseased and to normal skin seems not at all analogous to that of the staphylococci, for they appear to be present on the normal skin only as transients. In cases where they would seem to be resident, their presence is really due to persistent reinfection from other sites of the body (e.g., from the upper respiratory tract, etc.) Strains of group A hemolytic streptococcus, causation of erysipelas, are also present. However this infection is seldom met with at present because it yields promptly to the use of the sulfonamides and antibiotics. In impetigo contagiosa S aureus is generally believed to be the primary cause, the streptococcus but a secondary invader

Other organisms make up only a negligible proportion of the pathogens found on normal skin. Gram negative rods belonging to the genus Escherichia have been isolated rather frequently and neisseria from the skin of many children have been reported, but these are seldom responsible for pyodermas.

Mechanism of antibacterial action of normal skin —The currently accepted opinion among dermatologists is that the skin possesses a relatively specific antibacterial power through its acid mantle. This conclusion is based primarily on the studies of Marchionini and her associates showing that generally the bactericidal action of the skin varies inversely with its pH. Accordingly the susceptibility of intertriginous areas of the skin to bacterial infection may be a result of the relative alkalinity of these areas. Where sweat stands, it has been shown, the bacteria produce ammonia, which causes a sharp rise in alkalinity while on exposed surfaces, the rapid evaporation of sweat causes an acid concentration, particularly of lactic acid with a self-sterilizing effect.

Pillsbury and his co-workers have proved to their satisfaction that factors other than drying are unimportant in self-sterilization. Interesting in this connection are experiments showing that with the increase of the pH from a normal range of 5 to 7 the skin maintained its "degerming capacity" without impairment. Under these circumstances the skin's antibacterial capacity would seem not dependent on the acid mantle. Again, others believe that the antibacterial action of the skin may be due to the lipids through their active agency in the removal of transient bacteria from the skin. Pillsbury interprets this phenomenon as purely a

15

The Pyodermas

THE PYODERMAS encountered in infants and children include impetigo contagiosa ecthyma Ritter's disease, impetiginized eczema (Chapter 18) Bockhart's impetigo periporitis staphylogenes (frequently misnamed furunculosis) granuloma pyogenicum, erythema streptogenes dermatitis gangraenosa infantum, paronychia and hordeolum. In addition, certain of the common dermatoses of childhood are frequently complicated by secondary bacterial infection

The pyoderma group of microorganisms may attack either the superficial layers of the skin as in impetigo contagiosa or of the follicles also as in the impetigo of Bockhart. On the other hand, in ecthyma a small portion of the upper corium becomes the seat of infection. In periporitis staphylogenes, the infection may extend deep in the sweat ducts and surrounding tissues so that it may eventuate in a true subcutaneous abscess. Again, acute paronychia and pyoderma gangrenosum are examples of still deeper infection caused by staphylococci and streptococci

For a better understanding of the pyodermas and their management, it is well first to review briefly our knowledge of the skin's function as a protective barrier against infection.

The Skin as a Protective Barrier to Infection

The normal skin harbors constantly a rich flora of bacteria and fungi some transient others resident. Evans *et al.* studied variation in the skin flora for age, sex and race apparently only age causes any differences at all In keeping, Pillsbury *et al* found that children pick up bacteria much more readily than adults and consequently have a more varied flora, with neisseria streptococci sarcina and anaerobic spore-forming rods being encountered frequently It has been suggested that this difference in resistance to transients with age is due to the fact that the child secretes less sebum. Just as it is unknown exactly what characteristics enable the normal flora of the skin to maintain themselves so tenaciously similarly it is unknown what characteristics are lacking for their self sustenance in the transient invaders. However sampling from various areas of the body has revealed that transients are abundant on exposed skin and under the nails, while relatively scarce on clean, unexposed surfaces. Price concluded that the transients varying greatly in number and kind are usually acquired by contact and accordingly are free on the surface of the skin, or at best are but loosely attached along with dirt and fat. Evidently this fact alone could account for the relative ease with which the transients may be removed by mechanical and chemical means. On the other hand resident bacteria form a fairly stable flora more abundant on unexposed than exposed skin Firmly attached to the skin surface they are highly resistant to attack by detergents or germicides. Forces increasing or decreasing the number of resident bacteria

Fig. 63.—Impetigo contagiosa. A, following brush burn. (Courtesy of Dr Meyer L. Niedelman.) B extensive impetigo contagiosa of the face, impetiginized. (Courtesy of Dr C. S. Wright and Dr J. P. Guequierre.)

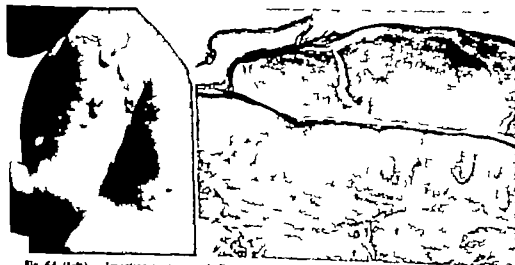


Fig. 64 (left).—Impetigo contagiosa, bullous type. (Courtesy of Dr Chaim Berlin, Tel Aviv, Israel.)
Fig. 65 (right).—Impetigo contagiosa. Histopathologic section shows vesicle containing exudate and polymorphonuclear leukocytes situated between the stratum corneum and the epidermis.

mechanical one Others hold opposite views

The common dermatoses of childhood that are frequently complicated by secondary bacterial infection include contact dermatitis superficial fungous infection scabies, pediculosis capitis insect bites trauma due to burns, abrasions, lacerations etc. atopic dermatitis, seborrheic dermatitis eczematous dermatitis due to food allergy drug allergy and other factors and herpes simplex. The role of damaged skin in infection is interpreted by various expositors in the light of their own particular theories on the mechanism of self-sterilization. Those who believe in specific chemical antibacterial activity think secondary infection is due to a disruption of the lipid surface Those who believe in a protective acid mantle think it is due to a failure of the acid to reach a sufficient concentration because of the retention of water by the serum in the wound Pillsbury believes that secondary infection is due merely to the antagonism of the serum to desiccation

Impetigo Contagiosa

Impetigo contagiosa is a contagious disease of the skin characterized by the appearance of superficial pustules and crusts, usually on the exposed portions of the body It is usually without symptoms, although itching may occur As a rule it terminates without sequelae.

The word "impetigo" is derived from the Latin *impetere* meaning to attack or commit aggression The term therefore denotes something that attacks the skin. It was formerly used to describe any skin condition characterized by the appearance of pus.

Streptococci and staphylococci are normal residents of the skin flora. Therefore recovery of these organisms upon culture does not necessarily indicate impetigo The clinical manifestations of the disease decide the diagnosis of impetigo contagiosa culture confirms it.

The *crusted type* of impetigo contagiosa is due to the Streptococcus pyogenes *Impetigo contagiosa bullosa* characterized by large bullae, is caused by the Staphylococcus pyogenes However when a culture is taken, both streptococci and staphylococci are recovered. The lesions in *Impetigo contagiosa gyrata (impetigo circinata)* spread peripherally the borders of the individual lesions becoming united with the borders of other lesions to form a series of circles or rings with clearance at their centers. The type has been described by Schamberg, Crocker and others. *Impetigo of Bockhart* is a superficial pustular perifolliculitis caused by streptococcus. Essentially the lesions consist of small globoid pustules occurring most frequently on the scalp and extremities, which rupture and are followed by crusts (see p 205)

Biology.—Impetigo contagiosa is one of the commonest dermatoses in children. It is important to recognize it early because it is highly contagious. A running nose or a discharging ear may cause impetigo contagiosa of the skin with which the discharge comes in contact. Impetigo contagiosa imposed upon other dermatoses is not uncommonly seen in children. Irritations such as ammoniacal dermatitis and insect bites serve to precipitate impetigo where normal conditions would yield little or no consequence. It sometimes follows chickenpox. The close contact of children in school is often sufficient to carry the contagious skin disorder over to uninfected individuals. The common housefly has also been incriminated as a source of infection.

The presence of impetigo contagiosa on the face and neck should suggest the possibility of pediculosis capitis lesions upon the buttocks, thighs and lower extremities should bring scabies to mind. Accordingly a search should be made for pediculi and their ova on the scalp or for the scabetic burrow and acarus in the sites of predilection.

Clinical Picture.—Although the lesions of impetigo contagiosa are generally found upon the exposed parts of the body any part of the skin and even the mucous membrane of the mouth may be involved. The common sites are the face, hands, ears neck and upper and lower extremities (Fig. 63) The disease begins as a pinhead-sized erythematous lesion, which may be mistaken for an insect bite but soon develops into a vesicle or bulla (Fig 64) The contents are clear in the beginning, but soon becomes seropurulent Once the thin-walled vesicle ruptures, a superficial yellowish, honeycombed waferlike crust accretes, which, when removed, exposes an eroded red weeping, superficial ulcer (Fig. 65) This author has seen

lonecrotic tuberculid, beginning as papules the size of pinhead, distributed symmetrically becoming necrotic and crusted and then disappearing spontaneously but tending to recur are differential characteristics. Furthermore, they are dependent upon a tuberculous focus elsewhere in the body and biopsy will disclose the true nature of the lesions. The history will aid in differentiating *variola*, which may be suggested by the presence of an epidemic of smallpox. The lesion of the rare *rupoid syphiloderm* is deeper and larger than ecthyma and, of course, a history of syphilis in parent and a positive result from serologic test also are helpful. The *furuncle* may be thought of but it is rare in children, seldom multiple, and it is follicular and has a center core. The superficial crusts, honeycombed and waferlike and presenting a stuck-on appearance are characteristics of *impetigo contagiosa* that differentiate it from ecthyma, in which the crusts are set on indurated bases and the underlying lesion is less superficial. In addition, the impetigo lesions ar more numerous and widely scattered than those of ecthyma. In *drug* eruptions, f course, the lesions present greater polymorphism and more erythema, are symmetrically situated upon the e tremities and show a wider area of distribution. Frequently also a history of ingestion f responsible drug can be obtained

Prophylaxis.—Impetigo contagiosa is a reportable disease in many cities, although many physicians tend to disregard such a directive. When diagnosis of impetigo has been established, the infected child should be isolated and the ttending physician should explain the contagious nature to the parents so that every ef fort may be made to prevent the infection of others. The patient should use separate soap, towels, wash cloths and linens, which should be boiled fter use

Attention to nasal discharge or discharging ear may prevent the development of *impetigo*. This of course, holds equally true of those skin disorders which may become complicated by impetigo contagiosa e.g., scabies, pediculosis capitis, etc

Whenever possible one should prevent spread of the lesions to uninvol ed areas. Bentonite and kaolin are xcellent for this purpose, inasmuch as they absorb the exudate and keep the lesion localized. Several proprietary preparations containing germicides with bentonite or similar material have been marketed. Where considerable exudation is present, the use of a hydrophilic ointment base serves to absorb the exudate and prevents the spread of the infection. Shake lotions containing germicides and bentonite are also useful. Crusts should first be



Fig. 66.—Ecthyma. Deep-seated crusted lesions of lower extremity. (Courtesy of Dr. C. S. Wright and Dr. J. P. Guequierre.)

removed by soap and water or by the use of keratolytic, such as 3 per cent of salicylic acid dissolved in olive oil or mineral oil. The oily preparation should be applied to the lesions for several hours by means of saturated gauze.

Treatment.—Impetigo contagiosa usually responds to the topical application of antibiotics (Table 15) which giv good results, or topical germicides (Table 16). However certain fundamental principles should be observed for optimum therapeutic results. Occasionally impetigo contagiosa, failing to respond to the more ordinary remedies, taxes the therapeutic skill

impetiginous bullae as large as a grapefruit and resembling bags of water on the trunk of a child The lesions soon spread to adjacent and even distant areas.

Diagnosis.—Diagnosis is made from the clinical features described above. A history of contact with other children having *impetigo* may be elicited, or the patient may have a running nose or a discharging ear to serve as the source of the organism.

Dermatoses likely to be confused with impetigo include *herpes simplex erythema multiforme bullosum*, pustular eczema, varicella, ringworm and ecthyma The rapid spread of the lesions to adjacent areas of the normal skin and the seropurulent exudate are two characteristics of impetigo that serve to differentiate it from *herpes simplex* in which the vesicles remain localized and in uncomplicated cases, clear The vesicles as a rule are clear also in *erythema multiforme bullosum* in which the distribution and location of the lesions also are differentiated characteristics The fact that in impetigo contagiosa the lesions are discrete differentiates it from *pustular eczema* in which also pruritus is invariably present. From *varicella* it can be differentiated by the size, polymorphism and distribution of lesions which remain vesicular in size in varicella in contrast to the bullae of impetigo contagiosa. From *ringworm* impetigo contagiosa circinata can be differentiated by the gyrate lesions of the latter and of course microscopic scrapings of the lesions will not reveal mycelial threads From *ecthyma* it can be distinguished by the type and distribution of the lesions which in ecthyma are adherent crusts overlying shallow ulcers which leave pitted scars.

Complications and Prognosis.—The incidence of glomerulonephritis following skin infection by the staphylococcus and streptococcus as reported in the literature varies from 0 to 31 per cent. Silvers states that impetigo ranks as one of the more important etiologic factors of acute nephritis Many other investigators also have reported cases of acute nephritis occurring as a complication of impetigo contagiosa. Callaway and O'Rear reported upon 36 children (of a total of 73) admitted to Duke Hospital with acute glomerulonephritis who had not had an upper respiratory infection but had had a preceding pyoderma. The average age of the children was 7½ years and the greatest incidence was in the 5 to 9 year age group. One patient died

The ordinary case of impetigo contagiosa runs a course lasting from a few days to a few weeks. With proper management the lesions heal without leaving scars. Since impetigo is restricted to the epidermis, complete healing occurs. The prognosis of acute nephritis complicating impetigo contagiosa is usually good.

Treatment—The management and topical treatment are discussed below under Ecthyma, since the topical treatment is similar for the two diseases.

Ecthyma

Ecthyma is a pyoderma more deeply seated than impetigo the lesion involves the upper cutis as well as the epidermis. Ecthyma is much less frequently seen today than it was several decades ago This present relative infrequency is due to more properly balanced and adequate diets improved hygiene, frequent bathing and cleanliness. The exciting causes is either the Streptococcus pyogenes or the Staphylococcus pyogenes or both.

Clinical Picture—The primary lesion is a vesicle or a vesicopustule situated upon an erythematous base and involving the upper corium. There is a firmly adherent crust with some induration in the base. When the crust is removed there is a small superficial craterlike ulcer the margins of which are elevated and which exudes seropus. The lesions are generally found on the legs (Fig. 66) and buttocks, although occasionally the upper extremities may be involved. The healing of ecthyma is followed by small pitted scars.

Diagnosis.—The typical crusts, resembling oyster shells with ulcers usually found upon the lower extremities and associated with exudation of pus render the diagnosis comparatively simple. If there is difficulty however the papulonecrotic tuberculid variola, rupoid syphiloderm, furuncle, impetigo contagiosa and drug eruptions may have to be ruled out.

The small, indolent granulomas of the papu-

papulonecrotic tuberculid beginning as papules the size of a pinhead, *distributed symmetrically* becoming necrotic and crusted and then disappearing spontaneously but *tending to recur* are differential characteristics. Furthermore, they are dependent upon a tuberculous *focus* elsewhere in the body and biopsy will disclose the true nature of the lesions. The history will aid in differentiating *variola*, which may be suggested by the presence of an epidemic of smallpox. The lesion of the rare *rupoid syphiloderm* is deeper and larger than ecthyma and, of course, a history of syphilis in a parent and positive result from serologic test also are helpful. The *furuncle* may be thought of but it is rare in children, seldom multiple, and it is follicular and has a center core. The superficial crusts, honeycombed and *a ferlike and presenting* stuck-on appearance are characteristics of *impetigo contagiosa* that differentiate it from ecthyma, in which the crusts are set on indurated bases and the underlying lesion is less superficial. In addition, the impetigo lesions are more numerous and widely scattered than those of ecthyma. In *drug* eruptions, of course, the lesions present greater polymorphism and more erythema, are symmetrically situated upon the extremities and show wider area of distribution. Frequently also, a history of ingestion of responsible drug can be obtained

Prophylaxis.—Impetigo contagiosa is reportable disease in many cities, although many physicians tend to disregard such a directive When diagnosis of impetigo has been established, the infected child should be isolated and the attending physician should explain the contagious nature to the parents so that every effort may be made to prevent the infection of others. The patient should use separate soap, towels, wash cloths and linens, which should be boiled after use.

Attention to a nasal discharge or a discharging ear may prevent the development of impetigo. This of course holds equally true of those skin disorders which may become complicated by impetigo contagiosa, e.g. scabies, pediculosis capitis, etc.

Whenever possible one should prevent spread of the lesions to uninvolved areas. Bentonite and kaolin are excellent for this purpose, inasmuch as they absorb the exudate and keep the lesion localized. Several proprietary preparations containing germicides with bentonite or similar material have been marketed. Where considerable exudation is present, the use of a hydrophilic ointment base serves to absorb the exudate and prevents the spread of the infection. Shake lotions containing germicides and bentonite are also useful. Crusts should first be removed by soap and water or by the use of a *keratolytic*, such as 3 per cent of salicylic acid dissolved in olive oil or mineral oil. The oily preparation should be applied to the lesions for several hours by means of saturated gauze.



Fig. 66.—Ecthyma Deep-seated crusted lesions of lower extremity (Courtesy of Dr C S. Wright and Dr J P Guequierre.)

Treatment.—*Impetigo contagiosa usually* responds to the topical application of antibiotics *(Table 15)* *which give good results*, or topical germicides (Table 16) However certain *fundamental principles* should be observed for optimum therapeutic results. Occasionally impetigo contagiosa, *failing to respond to the more* ordinary remedies, taxes the therapeutic skill

of the dermatologist. Such instances are usually due to insufficient trial

Some infants and children react badly to the local use of mercurials, which may serve as primary irritants or as sensitizing agents. This is particularly true of the 10 per cent ammoniated mercury ointment. It is my opinion that even 5 per cent ammoniated mercury ointment is too strong for treating most infants and many children. When it is tolerated, however a 5 per cent ammoniated mercury ointment is often used to treat impetigo contagiosa of the scalp.

Impetigo contagiosa that complicates scabies, pediculosis capitis, or a diaper dermatitis is managed like primary impetigo contagiosa. At times the therapy employed serves for the primary dermatosis also For example, the combination of salicylic acid and precipitated sulfur acts as a germicide and a scabieticide. Again mercuric sulfide (cinnabar) may be used

TABLE 15—ANTIBIOTIC AND CHEMOTHERAPEUTIC AGENTS AND THEIR DOSAGES FOR SYSTEMIC AND TOPICAL USE IN THE MANAGEMENT OF THE PYODERMAS

ANTIBIOTIC OR DRUG	PARENTERAL (Intramuscular)	TOPICAL	ORAL
Procaine penicillin G (aqueous suspension)	10 000 units/lb daily (150,000 units to 600,000 units daily)	Not used (high incidence of sensitization)	100,000-300,000 units 5 × daily ½ hr. a
Oxytetracycline (Terramycin)	6 mg./lb daily (in 2 doses)	30 mg./Gm.	10-20 mg./lb. daily (4 doses)
Chlortetracycline (Aureomycin)		30 mg./Gm.	10 mg./lb daily (in 4 doses)
Chloramphenicol (Chloromycetin)	30-60 mg./lb daily (in doses)	10 mg./Gm.	30-90 mg /lb daily (in 4 doses)
Erythromycin (Erythromycin) (Ilotycin)		5-10 mg /Gm.	20-30 mg /lb daily (in 4 doses)
Carbomycin (Magnamycin)			50 mg./lb. daily (in 4 doses)
Tetracycline (Achromycin) (Tetracyn) (Panmycin) (Polycycline)	6 mg./ lb daily (in 2 doses)		10-20 mg./lb daily (in 4 doses)
Novobiocin (Cathomycin) (Albamycin)			10-20 mg./lb. daily (in 4 doses)
Neomycin (Mycifradin)	4 mg /lb daily (in 4 doses)	5 mg /Gm.	50 mg./lb daily (in 4 doses)
Polymyxin (Aerosporin)	1 mg./lb daily (in 3 doses)		5 10 mg /lb. daily (in 4 doses)
Bacitracin	300 600 units/lb daily Never over 50,000 units daily (in 3 doses)	500 units/Gm.	1000 units/lb daily (in 4 doses)
Sulfisoxazole† (Gantrisin)	60 mg./lb daily (in 3 doses)		60 mg /lb. daily (in 4 doses)
Sulfadiazine or Sodium sulfadiazine†			60 mg /lb daily (in 4 doses)

Initial dose should be t [illegible] subsequent doses

†Dosage schedule modified lightly from Report of The Committee on The Control of Infectious Diseases, American Academy of Pediatrics, 1937

TABLE 16.—Bactericidal and Bacteriostatic Remedies Employed in the Topical Treatment of Impetigo, Ecthyma and other Pyoderma

Mercurials	
Bichloride of mercury	Wet dressing, 1 5,000-1 10,000.
Ammoniated mercury	Ointment. Ammoniated mercury ointment U.S.P. 5% Reduce to 2 3%
Mercuric sulfide (cinnabar)	In lotion with zinc oxide, talc, lime water 1 2%
Iodine	T. Iodine U.S.P. or diluted with equal quantity of 95% alcohol.
Vioform	Ointment or cream 1 3%
Copper	
Copper sulfate	Dalibour water diluted with water as wet dressing, 1 teaspoon to glass of water
Silver	
Silver nitrate	Wet dressing for topical application. Aqueous solution in distilled water 1 600, 3-10% Paint on lesions once daily
Potassium Permanganate	
Potassium permanganate crystals	Wet pack, soaks, compresses, 1 10,000-1 20,000. Bath for generalized impetigo, 1 50,000.
Sulfur	
Precipitated sulfur	As lotion with 1% cinnabar zinc oxide, talc, lime water 3-5%
	As ointment also containing salicylic acid 3% 3-5%
Dyes	
Gentian violet	Methylrosaniline chloride U.S.P. as aqueous solution (paint) with small quantity of alcohol 1 2%
Triple Dye†	Dyetonal (N.N.R. 1948) aqueous solution as paint, 2 6%
Merbromin N.F. (Mercurochrome)	As paint 2%
Quinoline Derivatives	
Chlorhydroxyquinoline	Ointment as quinolor compound ointment. 1 part should be mixed with at least 4 parts of petrolatum.

† A mixture of three dyes containing crystal violet 46%, brilliant green 31 and acriflavine 23%
[illegible] p. 71.

for the treatment of impetigo contagiosa and pediculosis capitis. As a general rule, however when impetigo contagiosa complicates any dermatosis, the impetigo should be treated first and the primary dermatosis after the impetigo has cleared.

It should be remembered that in the management of severe pyogenic infections of infants and children, particularly when treating impetigo contagiosa of the newborn, it is important to maintain proper fluid balance and an electrolyte balance, since dehydration from loss of serum from the skin and the inability to take fluid and nourishment by mouth may lead to acidosis and death.

Ammoniated mercury and other mercurials.—At one time my first choice for the treatment of impetigo contagiosa would have been a mercurial. Today however much better results can be accomplished from the topical application of one of the more modern antibiotics (Table 15) yet avoiding penicillin and the sulfonamides because of the high incidence of sensitization. Mercurials are still used, however and when untoward reactions ensue their use should be discontinued.

The manner of application of the white precipitate ointment is important Once the superficial crust has been removed, it is not necessary to rub the ointment into the lesion Application should be made by buttering gauze or lint which should be applied directly to the lesions and changed every three or four hours. It is seldom necessary to prescribe it in greater strength than 2 or 3 per cent for children, for it has been demonstrated that if such a strength fails with an impetigo stronger concentrations will likewise fail Most impetigos will clear within 10 to 14 days of treatment.

Mercuric sulfide, better known as cinnabar is particularly useful as a germicide when prescribed as a lotion.* It may be employed successfully in strength from 1 to 3 per cent in a zinc oxide, talc shake lotion applied as a paint several times daily

Alulotion containing 5 per cent of ammoniated mercury with kaolin and aluminum hydroxide gel has served the writer usefully absorbing vesicular exudates and at the same time serving as a local protective Alulotion is applied topically every hour until the oozing is checked and then once or twice a day

Iodine and other metallic salts—The 2 per cent tincture of iodine is an efficient bactericidal remedy which may be used for treating milder types of impetigo contagiosa. It should be painted over the lesions once or twice daily Recently Gershenfeld and Witlin have proposed the use of propylene glycol instead of alcohol as a vehicle for the iodine.

Silver nitrate a powerful germicide may be employed in strength of 0 1 to 5 per cent for localized lesions. The disadvantage common to all silver salts when employed locally is the brownish stain following their application. For generalized impetigo a bath of silver nitrate, 0.5 to 2 per cent is very useful.

Copper sulfate also known as blue vitriol may be used as a wet dressing, in 0.5 per cent strength It is a remedy both for impetigo and for pyoderma and should be remembered for the treatment of a stubborn impetigo failing to respond to other remedies Copper sulfate is particularly serviceable in the form of dalibour water †

Dyes—The aniline dyes are bactericidal and bacteriostatic. Gentian violet also known as aniline violet and crystal violet, is perhaps the most popular Almost every housewife knows that the child whose skin is painted with gentian violet has impetigo In this respect it may serve usefully in keeping away uninfected playmates. It may be prescribed in strength from 2 to 5 per cent in aqueous solution, to which may be added a small quantity of 95 per cent alcohol for its evaporating effect. The solution should be painted on the lesions once or twice daily after the crusts have been removed. It is not a suitable remedy when the lesions are extensive

Potassium permanganate—This is a powerful germicide astringent and oxidant. It may be employed as a wet dressing for localized lesions of impetigo in strength of 1 10 000 or as a bath when the lesions are extensive. For the latter purpose it should be used in strength of 1 20 000 Parents should be instructed to dissolve the crystals or tablets thoroughly otherwise a permanganate burn may occur

Vleminckx's solution—Vleminckx's solution (Sulfurated Lime Solution N F) is a favorite remedy with many British dermatologists. It is used diluted 1 part to 20 parts of water as a wet dressing. It discolors silver and gold owing to the action of its sulfur upon heavy metal. Accordingly parents should be warned to remove their jewelry when using it. Another objection is its unpleasant odor resembling that of rotten eggs.

Quinolor compound ointment—This preparation contains chlorhydroxy-quinoline. It is popular with many dermatologists for sycosis vulgaris and it is a very useful remedy for treating impetigo in children but should be reduced to one half or one third of its original prepared strength by the addition of more petrolatum

*This useful mercurial was first brought to the writer's attention by Dr Isadore Rosen of the Skin and Cancer Hospital, N w York.

†There are many different formulas for preparing dalibour water The designation D Albour often seen in the literature is incorrect It should be "dalibour after the originator of this prescription—not a French nobleman but French army medical officer Dalibour water is also a excellent topical remedy for the treatment of perlèche and herpes zoster (See Formulary 11 19)

Antibiotic therapy.—Some of the more commonly used antibiotic remedies and their dosages are listed in Table 15

The question frequently arises as to whether topical therapy should be employed alone or combined with systemic therapy in treating pyogenic disorders of children. The answer depends entirely on the results obtained with topical therapy alone. Undoubtedly systemic therapy with penicillin is frequently abused in the management of impetigo contagiosa.

It is my practice to treat localized lesions of *impetigo contagiosa* with one of the standard antibiotic ointments other than penicillin. If improvement fails to follow within the course of three or four days, I change to another antibiotic. If after giving several standard antibiotic ointments trial, the results are still poor it is my rule, in addition to topical therapy to use one of the standard antibiotics systemically nd to order antibiotic sensitivity tests.

It is my standing rule in every case of *ecthyma* to use systemic therapy with an antibiotic in addition to topical therapy with the antibiotics or other antibacterial remedies. The lesions in ecthyma are deeper than in impetigo contagiosa. Accordingly it seems logical to assume that local therapy alone may not reach the lesions as effectively and rapidly as when it is combined with systemic therapy P tients with ecthyma should receive daily intramuscular injections of penicillin procaine in oil or penicillin G procaine in aqueous suspension in dosage of 300,000 units. In addition to topical and intramuscular therapy an effort should be made to improve the child' health by a high vitamin diet and to correct secondary anemia by the use of inorganic iron.

See Formulary R 4 44 58 59 60, 61 62, 71 91 *for localized impetigo* 9 (bath) 58, 59 60 61 6 *for generalized impetigo* 74 *for recalcitrant types* 86, 87 88 *for removal f crusts.*

Ritter's Disease

(Dermatitis Exfoliativa Neonatorum, Keratolysis Neonatorum)

The disease was first described by Ritter von Rittershain peculiar septic exfoliative dermatitis of newborn infants It is an acute bacterial infection of the neonatal period characterized by vesicles, bullae and exfoliation of the skin and usually running a severe course. Prior to the antibiotics the disease was accompanied by a high mortality

The disease occurs usually in the second week of life. Hemolytic Staphylococcus aureus can be cultured from the lesions but blood cultures are usually sterile. The portal of entry may be either the skin or the gastro-intestinal tract. It has been suggested that a staphylococcic toxin may be responsible for the severe damage to the skin observed both clinically and histopathologically Whatever the etiologic background, the disease is commonly seen in well nourished and apparently healthy infants.

Clinical Picture —The disease is at first characterized by localized areas of redness which rapidly become widespread over the entire body and which develop exfoliation and crusting. Or again, desquamation may follow the hyperemia after a few days. There is no single site of predilection for the exfoliation On the other hand, the disease may begin by the appearance of a few vesicles and bullae from which hemolytic staphylococci may be obtained on culture. Or an infant may have no detectable skin lesion before massive exfoliation begins. The hyperemia may be so intense that large areas of epidermis are undermined and desquamate, leaving the raw corium exposed with red, moist-looking, raw surface not unlike scald. A slight exfoliation (epidermolysis) of the epidermis is an important sign in the disease (Fig. 67) When the skin is gently stroked with the edge of a tongue depressor the epidermis may be stripped free from the corium. This phenomenon is known as Nikolsky sign. However it is not a pathognomonic sign of Ritter's disease, since it occurs also in other dermatoses. Following this period of desquamation, the skin becomes dry and is covered with fine scales and crusts. In favorable cases the scales disappear and the skin returns to normal. Recovery ensues in a week or 10 days from the time of the first symptoms.

The mucosa of the mouth may or may not be affected by small vesicles; stomatitis, rhinitis, or even corneal ulcers may be present. The mucocutaneous junctions about the mouth are often fissured and bear some resemblance to

The manner of application of the white precipitate ointment is important. Once the superficial crust has been removed it is not necessary to rub the ointment into the lesion. Application should be made by buttering gauze or lint which should be applied directly to the lesions and changed every three or four hours. It is seldom necessary to prescribe it in greater strength than 2 or 3 per cent for children for it has been demonstrated that if such a strength fails with an impetigo stronger concentrations will likewise fail. Most impetigos will clear within 10 to 14 days of treatment.

Mercuric sulfide, better known as cinnabar is particularly useful as a germicide when prescribed as a lotion.* It may be employed successfully in strength from 1 to 3 per cent in a zinc oxide, talc shake lotion, applied as a paint several times daily.

Alulotion containing 5 per cent of ammoniated mercury with kaolin and aluminum hydroxide gel has served the writer usefully absorbing vesicular exudates and at the same time serving as a local protective. Alulotion is applied topically every hour until the oozing is checked, and then once or twice a day.

Iodine and other metallic salts.—The 2 per cent tincture of iodine is an efficient bactericidal remedy which may be used for treating milder types of impetigo contagiosa. It should be painted over the lesions once or twice daily. Recently Gershenfeld and Witlin have proposed the use of propylene glycol instead of alcohol as a vehicle for the iodine.

Silver nitrate a powerful germicide may be employed in strength of 0.1 to 5 per cent for localized lesions. The disadvantage common to all silver salts when employed locally is the brownish stain following their application. For generalized impetigo a bath of silver nitrate, 0.5 to 2 per cent is very useful.

Copper sulfate, also known as blue vitriol, may be used as a wet dressing, in 0.5 per cent strength. It is a remedy both for impetigo and for pyoderma and should be remembered for the treatment of a stubborn impetigo failing to respond to other remedies. Copper sulfate is particularly serviceable in the form of dalibour water.†

Dyes.—The aniline dyes are bactericidal and bacteriostatic. Gentian violet, also known as aniline violet and crystal violet, is perhaps the most popular. Almost every housewife knows that the child whose skin is painted with gentian violet has impetigo. In this respect it may serve usefully in keeping away uninfected playmates. It may be prescribed in strength from 2 to 5 per cent in aqueous solution, to which may be added a small quantity of 95 per cent alcohol for its evaporating effect. The solution should be painted on the lesions once or twice daily after the crusts have been removed. It is not a suitable remedy when the lesions are extensive.

Potassium permanganate.—This is a powerful germicide, astringent and oxidant. It may be employed as a wet dressing for localized lesions of impetigo in strength of 1:10,000 or as a bath when the lesions are extensive. For the latter purpose it should be used in strength of 1:20 000. Parents should be instructed to dissolve the crystals or tablets thoroughly: otherwise a permanganate burn may occur.

Vleminckx's solution.—Vleminckx's solution (Sulfurated Lime Solution N.F.) is a favorite remedy with many British dermatologists. It is used diluted, 1 part to 20 parts of water as a wet dressing. It discolors silver and gold owing to the action of its sulfur upon heavy metal. Accordingly parents should be warned to remove their jewelry when using it. Another objection is its unpleasant odor resembling that of rotten eggs.

Quinolor compound ointment.—This preparation contains chlorhydroxy-quinoline. It is popular with many dermatologists for sycosis vulgaris and it is a very useful remedy for treating impetigo in children but should be reduced to one half or one third of its original prepared strength by the addition of more petrolatum.

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† There are many different formulas for preparing dalibour water. The designation "D Alibour," often seen in the literature, is incorrect; it should be "dalibour" after the originator of this prescription—not a French nobleman but a French army medical officer. Dalibour water is also an excellent topical remedy for the treatment of perlèche and herpes zoster. (*See Formulary*, II 19.)

of the family. Denuded areas of the skin common in Ritter's disease are absent. In *congenital syphilis*, in addition to bullae other concomitants of congenital syphilis are present such as rhagades, snuffles, and enlarged liver and spleen. Roentgenologic examination of the long bones and blood serologic testing will clear up any doubt.

Complications and Prognosis.—Complications that have been reported include ulcerative gastritis and stenosed duodenum, corneal ulcers, pneumonia, erysipelas, furuncles, eczema and gangrene. It has also been reported associated with ulcers in the jejunum. Death may occur as result of exhaustion or of such complications.

Prior to the introduction of the antibiotics, the disease was accompanied by a 50 per cent mortality. Only when therapy is started with the earliest signs of the illness is a fatal outcome prevented.

Prophylaxis.—Control of the disease depends upon rigid cultural control of nursery personnel providing for the exclusion of all those with nasopharyngeal cultures positive for a hemolytic staphylococci, together with the prophylactic inunction of all exposed infants with 5 per cent sulfathiazole in a water-soluble ointment base.

Treatment.—The antibiotics of choice include streptomycin, Terramycin and Chloromycetin. Cultures from the skin lesions for sensitivity will determine the type of antibiotics to be employed. Streptomycin may be tried in doses of 75 mg. twice daily and Crysticillin in doses of 150,000 units daily. Local therapy consists of potassium permanganate baths, Aureomycin ointment, and later Terramycin and bacitracin ointment. Phenobarbital el ur may be used for sedation. It is important to maintain a proper fluid balance and electrolyte balance in order to prevent dehydration.

Impetigo of Bockhart

(Superficial Pustular Perifolliculitis)

Impetigo of Bockhart is caused by the Streptococcus pyogenes. Clinically it is characterized by member of superficial pustules, many of which upon close inspection are seen to be pierced by hair. Areas of predilection are the hairy regions of the body particularly the upper and lower extremities (Fig. 68) and the scalp. Such lesions not uncommonly follow injury such as a scratch or an insect bite.

Impetigo of Bockhart differs from a furuncle in that the latter is a deep-seated folliculitis and is accompanied by perifollicular cellulitis terminating in suppuration and necrosis with discharge of a core.

Management consists in the use of soap and warm water to remove the superficial crusts, followed by a wide spectrum antibiotic ointment or cream applied at frequent intervals, similar to the topical treatment for *impetigo contagiosa*. In stubborn cases parenteral antibiotic therapy may be indicated.

See Formulary ℞ 20.

Periporitis Staphylogenes

(Furunculosis, Pustular Syringitis, Pustular Miliaria)

Periporitis staphylogenes, as the term implies, is an infection around the sweat ducts. It is most commonly caused by the Staphylococcus pyogenes. The term "furunculosis" is misnomer.

Although no accurate statistics are available this author is of the opinion that the condition is more common in the newborn than in older children. Staphylococcus pyogenes (aureus) normally is a harmless saprophytic resident of the skin. However under the influence of certain precipitating factors (excessive sweating, trauma, a change of the pH of the skin, humid weather etc.) the nonpathogenic saprophytic staphylococci become transformed into pathogens which invade the outlets of the sweat ducts. Under favorable circumstances they migrate into the deeper structures whose resistance has been reduced or altered (locus minoris resistentiae) there to develop into the disease described as periporitis staphylogenes. The commonest primary cause is poral closure caused by excessive sweating, as is commonly experienced by newborn infants during hot, humid weather in rooms and nurseries that are not air-conditioned. While the condition is very common in infants, it is by no means rare in adults; indeed it can occur at any age or in any sex group.



Fig. 67.—Ritter's disease (dermatitis exfoliativa neonatorum) in an infant. Note the denudation of the superficial layers of the skin. Nikolsky's sign was positive. Large bullae were present.

syphilitic rhagades Constitutional symptoms are usually absent as is also fever The clinical picture is most characteristic once it is recognized as an entity Refusal of feedings is invariably the earliest sign that something is wrong. Regurgitation and vomiting ensues with progressive severity and frequency Prostration, lethargy and marked abdominal distention follow with alarming rapidity Mucoid green stools appear on the second day and a shock like state supervenes Some infants rapidly become jaundiced During the last few hours of life, the superficial layers of the skin often hang in large shreds after exfoliation from sizable areas. In the fatal cases large areas of epidermis could be sloughed off with gentle pressure at autopsy A slight leukocytosis may occur

Diagnosis.—According to Ritter the most important symptoms of the disease are the swelling, maceration and exfoliation of the epidermis. Beginning about the second week of life it usually appears as localized areas of redness about the mouth which rapidly spread over the entire body and are accompanied or followed by desquamation that leaves denuded areas resembling a scald. Lesions may consist of vesicles, bullae and crusts constitutional symptoms and fever as a rule are absent. The disease is followed by recovery within a week or ten days. In fatal cases, death ensues in three or four days.

Ritter's disease should be differentiated from Leiner's disease impetigo neonatorum, erythroderma ichthyosiforme congenitale, epidermolysis bullosa hereditaria and congenital syphilis

Differential Diagnosis.—In *erythroderma desquamativa* (Leiner's disease) there are no vesicles, bullae or denuded areas of the skin, and Nikolsky's sign is absent. Ritter's disease begins earlier than Leiner's disease (the latter seldom before the fourth week) Leiner's disease is characterized by seborrheic dermatitis of the scalp which is absent in Ritter's disease. Leiner's disease begins on the buttocks whereas Ritter's disease usually begins about the mouth. *Impetigo neonatorum* is characterized by superficial vesicles, pustules and crusts and responds rapidly to topical antibiotic therapy *Erythroderma ichthyosiforme congenitale* is present at birth The flexures are usually involved. The condition is persistent and chronic. Vesicles, bullae, denuded areas of the skin and Nikolsky's sign are absent. *Epidermolysis bullosa hereditaria* is characterized by vesicles and bullae usually on the skin over bony prominences. The condition may be present in other members

Clinical Picture.—The lesions consist of discrete, minute (pinhead to pea-sized) disseminated papules and pustules distributed almost anywhere over the skin surface, but especially common over the skin of the scalp forehead, neck, upper half of the chest, shoulders, upper extremities and back (Fig. 69) Different sized lesions may be present simultaneously Early in the disease the papules and pustules appear as minute, erythematous, indurated lesions, sometimes papular sometimes nodular

They are not superficial but deep-seated, as can be determined by the palpating fingers. However the small papules soon enlarge, become more elevated, soften and finally fluctuate, resulting in true pustule and at a later stage an abscess When lesions of all sizes are present t the same time some will appear as miliaria, others as small and large papules or pustules the latter sometimes opaque and as large as cherries When incised, such a pustule yields a thick creamy pus. Some of the older lesions rupture spontaneously untreated others undergo desiccation, while many of the smaller ones involute completely The larger lesions become hard and fibrotic.

Diagnosis.—Diagnosis is comparatively simple Minute and larger pustules and nodules appear as discrete lesions especially on the scalp face, chest, shoulders or scattered on the trunk. The condition occurs especially during hot, humid weather and in overheated nurseries. It is frequently associated with miliaria. The condition should be differentiated from furunculosis and impetigo contagiosa, especially the bullous type.

A *furuncle* is seldom a multiple lesion and occurs usually over a hairy site, or on the neck back or buttocks. A boil is extremely tender after it ruptures and discharges pus, a central core remains, which is usually discharged spontaneously In *impetigo contagiosa* the lesions are superficial and not so numerous as in periporitis staphylogenes. The latter condition is deep-seated, when a pustule ruptures, a superficial, w ferlike, golden yellow *crust remains*.

Prognosis—Generally the condition clears with proper antibiotic therapy which should be given promptly in order to prevent serious complications. However in some infants and children, the condition recurs despite prompt internal and external measures.

Management and Prophylaxis.—The prevention of periporitis staphylogenes caused by excessive sweating depends upon eliminating the cause Miliaria due to overheated rooms and excessive clothing can be prevented simply by reducing the room temperature and putting less oppressive clothing on the infant's body In



Fig 69 —Periporitis staphylogenes in an infant 6 months of age. Note the deep-seated papules and pustules on scalp, forehead and nose.

the summer the infant should receive frequent cooling baths. In winter he should not be over heated Cotton or rayon should be substituted for wool.

A suitable temperature is 70° F Today an air-conditioned oom is desirable when the cost is not prohibitive, except in the case of prematures. For those who can meet the costs, residence at the seashore or mountains is ideal during hot, humid weather A simple precaution during the hot season is that the child should never be placed in the direct rays of the sun for a prolonged period. In the summer cotton underwear is ideal. For all other seasons, including late fall, winter and early spring, heavier cotton may be used. During very hot days, the infant should be sponged frequently with cool

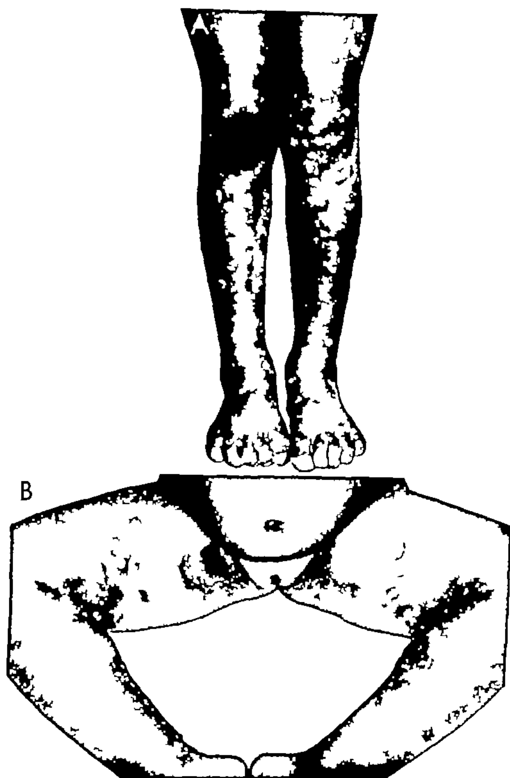


Fig 68 —Impetigo of Bockhart A, in a child 5 years of age B in a child 3 years of age in whom similar lesions appeared on the upper extremities.

injury scratch or insect bite. It is seen most frequently in adolescent boys and girls, less frequently in younger children and uncommonly in infants. The causative organism is probably the Staphylococcus aureus.

Clinical Picture.—The lesion may appear on any part of the skin or mucous membrane. Common sites include the face, cheeks, chin, hands, and other exposed parts (Fig. 70) In children lesions have been found on the shoulders, trunk, umbilical region and back. As a rule, only one lesion is found.

On examination, the single lesion is found to consist of globular or flat-topped nodule which varies in size from that of a split pea to a pecan nut, or sometimes larger It is of a dull red, blue-red, scarlet-red or brown-red color somewhat elastic, containing a slight amount of slimy pus (seropurulent) It may even appear as a raw granulating surface. When the seropurulent exudate dries, it results in a crust. Occasionally the lesion may be pedunculated and sometimes even sessile. Because granuloma pyogenicum is highly vascular it bleeds at the slightest provocation, especially when traumatized. Another feature is its rapid growth, which is especially noticeable at the beginning, although later the lesion develops at a much slower rate until the maximum size is attained. As rule it is painless, but it may be tender and it occasionally offers a foul odor

Diagnosis.—Diagnosis is based on the clinical picture. Biopsy may be required in difficult cases.

The condition should be differentiated from angiomata and papillomata. The history of rapid growth characteristic of granuloma pyogenicum serves to differentiate it at once from *angiomata*, which are slow in their development. Granuloma pyogenicum is uncommon in infants, in contrast to angiomata which are likely to appear at birth or soon after *P pillomata* consist of verrucous growths that are brown in color never the bright red characteristic of granuloma pyogenicum The lesions as a rule present at birth, while granuloma pyogenicum is seldom seen in infancy Further papillomata are hard, not elastic as are the lesions of granuloma pyogenicum nor do they bleed when traumatized

Complications and Prognosis.—There are no complications as a rule. Prognosis is good although recurrences are not uncommon, especially if the lesions are imperfectly destroyed. Management and prophylaxis consist of the antiseptic care of any lesion following insect bite, scratch or other injury Even so prevention of granuloma pyogenicum is not always possible.

Treatment.—Treatment consists in the employment of destructive measures such as excision, electrodesiccation, electrocoagulation, actual cautery and cauterization with caustics.

Granuloma pyogenicum of the umbilical cord may be treated effectively with a single application of fused silver nitrate (lunar caustic) or instead the application of mono- di- or trichloracetic acid may be used. However a second and possibly a third application of these escharotics may be required to effect a cure. On the whole, the simplest method of treatment is to anesthetize the lesion with either 2 per cent or 3 per cent procaine hydrochloride and then electrodesiccate it thoroughly

Erythema Streptogenes

Erythema streptogenes is a chronic dermatosis characterized by erythematous, scaly circumscribed patches followed by depigmentation. The condition is self-limited but usually lasts months or years. It is apparently the same as pityriasis simplex of the face, called by French authors dartes volantes. It occurs chiefly in children and in both Negro and white races. The Streptococcus hemolyticus and Staphylococcus hemolyticus have been recovered in cultures from the lesions.

Clinical Picture.—The primary lesion appears either as a macule or as a mild form of dermatitis. The areas of predilection include exposed areas, particularly the cheeks, forehead and other parts of the face (Fig. 71) The lesions consist of annular circumscribed areas of erythema. The erythema, subsiding in one or two weeks, is followed by a fine, scanty branny scaling, then succeeded by a partial depigmentation.

The condition is asymptomatic. Some children complain of slight itching or a mild burning sensation. With time the depigmentation

water or witch hazel water After drying, a dusting powder such as cornstarch or an unscented talc may be used

Treatment—Since ointments generate heat and macerate the skin, they are best avoided *Occasionally good results are secured through* the use of wet dressings such as aluminum acetate (Burow's solution) Fortunately the introduction of antibiotics is effective, particularly intramuscular injections of penicillin procaine in aqueous suspension. The dose depends upon the extent and severity of the infection In the infant and young child, usually 300 000 units of aqueous penicillin procaine may be given daily until the condition improves. In addition to parenteral therapy topical applications of the non sensitizing antibiotics have been prescribed The most effective and least sensitizing are chlortetracycline (Aureomycin) oxytetracycline (Terramycin) chloramphenicol (Chloromycetin) Erythromycin bacitracin and neomycin ointment. They can be dispensed in a polyethylene glycol base or an o/w emulsion to aid the penetration of the medicament so that the affected eccrine glands may be reached. Lubowe has described the effective use of a bacitracin neomycin ointment in the treatment of pyogenic dermatoses.

Anticholinergic compounds seem to present a beneficial effect in the reduction of cases of hyperhidrosis and dyshidrosis, and should be tried in the young child who shows disposition to repeated attacks of periporitis. The adult dosage should be reduced depending upon the weight of the patient. The least toxic of the anticholinergic compounds has been found to be mepiperphenidol bromide (formerly piperphenamine)

When the lesions have progressed to the stage of well defined pustules, bullae or abscesses, these should be incised under aseptic precautions and the pus evacuated Crusted lesions must be removed with soap and water before topical application of an antibiotic ointment. Antiphlogistic baths of starch or oatmeal (Aveeno) may be prescribed to relieve local discomfort. Frequent sponging with witch hazel water followed by dusting with a fine unscented talc is comforting.

See Formulary ℞ 24 26, 27 for prophylaxis.

Surex, Dial and Gamophen soaps containing 2 per cent hexachlorophene have been found useful in preventing periporitis staphylogenes. pHisohex detergent *and Johnson and Johnson baby lotion also contain* hexachlorophene. They have proved useful in decreasing miliaria during the summer months.

Granuloma Pyogenicum
(Pyogenic Granuloma)

The lesions of granuloma pyogenicum are rapidly growing tumors, *occasionally* pedunculated which are found to develop after an

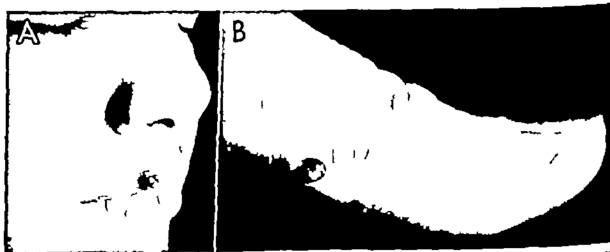


Fig 70.—Granuloma pyogenicum. The type of lesion in A is frequently mistaken for a small angioma. (Courtesy of Dr Herbert M Leavitt) In B the dark raised lesion is on the inner aspect of the thumb. (Courtesy of Dr John C Belisario. Photography by Mr Woodward Smith, Department of Artistry University of Sydney)

injury scratch or insect bite. It is seen most frequently in adolescent boys and girls, less frequently in younger children and uncommonly in infants. The causative organism is probably the Staphylococcus aureus.

Clinical Picture.—The lesion may appear on any part of the skin or mucous membrane. Common sites include the face, cheeks, chin, hands, and other exposed parts (Fig. 70). In children lesions have been found on the shoulders, trunk, umbilical region and back. As a rule, only one lesion is found.

On examination, the single lesion is found to consist of a globular or flat-topped nodule which varies in size from that of a split pea to a pecan nut, or sometimes larger. It is of a dull red, blue-red, scarlet-red or brown-red color somewhat elastic, containing a slight amount of slimy pus (seropurulent). It may even appear as a raw granulating surface. When the seropurulent exudate dries, it results in a crust. Occasionally the lesion may be pedunculated and sometimes even sessile. Because granuloma pyogenicum is highly vascular it bleeds at the slightest provocation, especially when traumatized. Another feature is its rapid growth, which is especially noticeable at the beginning, although later the lesion develops at a much slower rate until the maximum size is attained. As rule it is painless, but it may be tender and it occasionally offers a foul odor.

Diagnosis.—Diagnosis is based on the clinical picture. Biopsy may be required in difficult cases.

The condition should be differentiated from angiomata and papillomata. The history of rapid growth characteristic of granuloma pyogenicum serves to differentiate it at once from *angiomata*, which are slow in their development. Granuloma pyogenicum is uncommon in infants, in contrast to angiomata which are likely to appear at birth or soon after. *Papillomata* consist of verrucous growths that are brown in color never the bright red characteristic of granuloma pyogenicum. The lesions are as a rule present at birth, while granuloma pyogenicum is seldom seen in infancy. Further papillomata are hard, not elastic as are the lesions of granuloma pyogenicum nor do they bleed when traumatized.

Complications and Prognosis.—There are no complications as a rule. Prognosis is good although recurrences are not uncommon, especially if the lesions are imperfectly destroyed. Management and prophylaxis consist of the antiseptic care of any lesion following insect bite scratch or other injury. Even so prevention of granuloma pyogenicum is not always possible.

Treatment.—Treatment consists in the employment of destructive measures such as excision, electrodesiccation, electrocoagulation, actual cautery and cauterization with caustics.

Granuloma pyogenicum of the umbilical cord may be treated effectively with a single application of fused silver nitrate (lunar caustic) or instead the application of mono- di- or trichloracetic acid may be used. However a second and possibly a third application of these escharotics may be required to effect a cure. On the whole, the simplest method of treatment is to anesthetize the lesion with either 2 per cent or 3 per cent procaine hydrochloride and then electrodesiccate it thoroughly.

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The condition is asymptomatic. Some children complain of slight itching or a mild burning sensation. With time the depigmentation

becomes more marked indeed many months or years may elapse before it disappears completely

Diagnosis.—In young children circumscribed erythematous lesions upon the face, associated with a fine branny scale which soon becomes depigmented are generally erythema streptogenes

The condition should be differentiated from vitiligo and achromia parasitica. In *vitiligo* the



Fig. 71.—Erythema streptogenes. Note the depigmented scaly areas on the forehead and cheeks of this boy (Courtesy of Dr Thomas Butterworth.)

depigmentation is more pronounced and more sharply defined and the borders of the lesions usually show some hyperpigmentation *Achromia parasitica* may closely simulate erythema streptogenes. Unlike it, however the lesions develop and spread rapidly and may cover the entire body in the course of a few weeks. An aspergillus has been isolated in some cases. The condition is generally resistant to therapy

Prognosis and Treatment—The general health remains good The depigmented patches may persist for years.

Equal quantities of hydrocortisone acetate ointment, 1 0 or 2.5 per cent, and a wide spectrum antibiotic ointment such as erythromycin, bacitracin or Neosporin comprise a treatment that is effective in hastening involution of the lesions.

See Formulary ℞ 45 as keratolytic, 63 as bactericidal.

Dermatitis Gangraenosa Infantum

(Ecthyma Gangraenosa Pemphigus Gangraenosis, Varicella Gangraenosa)

Dermatitis gangraenosa infantum is a necrotizing eruption occurring in young children and usually although not invariably preceded by one of the exanthemata The infection has been attributed variously to bacterial invasion, toxic process and allergy Pasachoff and Sobel have suggested that the condition may represent a Schwartzman phenomenon i.e., the areas involved having been previously sensitized to bacteria, the necrotized skin is the effect of the antigen. It is believed that the condition represents a thrombosis of the veins situated deep in the corium

The condition is uncommon. It is more frequent in females than in males. In Hutchinson s original cases it occurred as a complication of varicella and vaccinia Other reported instances have followed rubeola, purpura pertussis and smallpox. It often appears spontaneously without preceding illness or skin ailment.

Malnourished cachectic infants are said to be prone to the infection, but many instances in healthy well nourished infants have been reported It usually appears before the age of 3 years. Among the micro-organisms recovered from the skin lesions are virulent Staphylococcus aureus and Streptococcus viridans. Stulik and Nachman were able to culture a hemolytic Staphylococcus aureus from the lesions and from the blood stream.

Clinical Picture—The onset is sudden The initial lesion appears as a discrete rounded or oval-shaped bulla or pustule Sometimes the lesions are hemorrhagic; they vary in size from a pinhead to a pea, usually appearing in groups. At other times a plaque of erythema appears which is soon followed by a group of papules, vesicopapules or pustules Several lesions in close proximity may unite and become conflu-

ent. Soon afterward a darkened area appears in the center of the vesiculopustular plaque. It is followed by an eschar. On removing the eschar an ulcer may be seen consisting of different-sized, "punched out" holes with a small amount of discharging pus. Healing occurs after many weeks or several months, leaving scars. The pigmentation completely disappears.

The areas of predilection are the legs, thighs, buttocks, pubic area and face (Figs. 72, 73). Constitutional symptoms vary considerably depending on the mildness or severity of the infection. In mild cases the patient may be happy, playful and afebrile. In severe instances, there may be high fever, chills, rapid pulse, gastrointestinal disturbances, prostration, malaise and delirium. Repeated episodes may continue for weeks or months.

Diagnosis.—Diagnostic characteristics are the fact that the condition occurs in infants under 3 years of age, with the eruption appearing suddenly on the face, buttocks and thighs and usually although not invariably preceded by varicella, measles or scarlet fever. The numerous gangrenous ulcers or deep ulceration start as a pustule, then enlarge and dry with a crust in the center and are surrounded by an erythematous halo. There may be repeated episodes.

The condition should be differentiated from congenital syphilis, dermatitis exfoliativa neonatorum, erythroderma desquamativa and ecthyma. The absence of snuffles, of desquamation of the palms and soles, of rhagades, and of other concomitants of congenital syphilis, is sufficient to rule out *congenital syphilis*. Serologic blood tests also will give negative results. The lesions of *Ritter's disease*, which occurs usually during the first two weeks of life, consist of large denuded erythematous areas. Nikolsky's sign is present in Ritter's disease but absent in dermatitis gangraenosa infantum. In *erythroderma desquamat*... *(Leiner's disease)*, the condition is generalized with erythroderma and desquamation of the skin. The scalp is the seat of seborrheic dermatitis. Necrotized areas of skin are absent. *Ecthyma* may be mistaken for dermatitis gangraenosa infantum before the center lesion becomes necrotized. It usually occurs as a single lesion however or as several lesions on one or both lower extremities. Grossly the lesion is crustaceous resembling oyster shell, and it is never gangrenous.

Complications and Prognosis.—Localized pulmonary abscesses and pleural and pericardial empyema have been reported as complications. The disorder invariably leaves some scarring.

The prognosis depends on the extent of involvement, the virulence of the organism and the general health of the infant. Darier states that the mortality is 50 per cent. In mild cases with comparatively few lesions, the condition disappears with complete recovery. On the other hand, fulminating cases with extensive involvement of the skin may be followed by death. As a rule, the younger the infant, the graver the prognosis.

Treatment.—Antibiotic therapy is the treatment of choice. A culture of the organism from the skin should be made and its sensitivity and resistance to the various antibiotics should be carried out routinely. During this time, procaine penicillin (aqueous) in doses of 300,000 units should be administered by intramuscular injection every four hours. This treatment then should be replaced by the ideal antibiotic as determined by the sensitization tests on the responsible organism. In my own experience, Ilotycin in doses of 200 mg. every four hours, administered by mouth, has resulted in rapid improvement in an 18-month-old girl. The antibiotic was continued for several weeks after the acute symptoms had subsided.

During the acute stage, wet dressings of 1:20 aluminum acetate (Burow's) solution are serviceable. Multiple small blood transfusions are indicated to combat septicemia. During the acute stage a liquid diet high in calories and vitamins may be indicated. In chronic cases an autogenous vaccine or staphylococcus toxoid may be given a trial.

Pyogenic Paronychia

Pyogenic paronychia may be acute or chronic and may be limited to one or several fingers or toes. It is caused by staphylococci,

Ilotycin Pediatric (brand of erythromycin) is marketed in 10 cc. vials. When the contents of the vial are dissolved in 10 cc. of water each 1 cc. contains 100 mg. of Ilotycin.

becomes more marked indeed many months or years may elapse before it disappears *completely*

Diagnosis.—In young children circumscribed erythematous lesions upon the face, associated with a fine branny scale which soon becomes *depigmented* are generally erythema streptogenes.

The condition should be differentiated from vitiligo and achromia parasitica In *vitiligo* the depigmentation is more pronounced and more sharply defined and the borders of the lesions usually show some hyperpigmentation *Achromia parasitica* may closely simulate erythema streptogenes. Unlike it however the lesions develop and spread rapidly and may cover the entire body in the course of a few weeks. An aspergillus has been isolated in some cases. The condition is generally resistant to therapy



Fig. 71.—Erythema streptogenes. Note the depigmented scaly areas on the forehead and cheeks of this boy (Courtesy of Dr Thomas Butterworth.)

Prognosis and Treatment —The general health remains good The depigmented patches may persist for years

Equal quantities of hydrocortisone acetate ointment, 1 0 or 2.5 per cent, and a wide spectrum antibiotic ointment such as erythromycin, bacitracin or Neosporin, comprise a treatment that is effective in hastening involution of the lesions.

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The condition is uncommon It is more frequent in females than in males. In Hutchinson's original cases it occurred as a complication of varicella and vaccinia Other reported instances have followed rubeola, purpura, pertussis and smallpox. It often appears spontaneously without preceding illness or skin ailment.

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Clinical Picture —The onset is sudden. The initial lesion appears as a discrete rounded or oval-shaped bulla or pustule Sometimes the lesions are hemorrhagic they vary in size from a pinhead to a pea usually appearing in groups. At other times a plaque of erythema appears which is soon followed by a group of papules, vesicopapules or pustules Several lesions in close proximity may unite and become conflu-

streptococci and Candida albicans. The condition follows trauma or injury from a scratch, an insect bite or from manicuring the nails.

Clinically the condition is characterized by a tender and painful swelling around the side or at the proximal end of the nail. In chronic cases the nail is distorted. A drop or two of pus may be expressed when pressure is applied to the area. Monilial paronychia develops more gradually and is less painful than the pyogenic type. It is characterized by a "sausage-like" swelling of the soft tissue.

Management consists in the application of antiseptics. For the acute inflammatory stage, wet dressing of either isotonic salt solution or potassium permanganate (1:10,000) should be employed, followed by antibiotic ointments. Incision and drainage may be indicated and in resistant cases removal of the nail may be necessary.

For monilial paronychia 3–5 per cent gentian violet solution should be applied beneath the cuticle by means of a cotton applicator. Mycostatin should be prescribed both for oral administration and, in ointment form, for topical application.

Hordeolum

(Stye)

A stye is a circumscribed, acute inflammation of the margin of the eyelid. It is due to staphylococcal infection of one of the sebaceous hair follicles. Styes may be caused by errors in refraction, general debility, fatigue and secondary anemia. The internal form is called a chalazion.

Clinically a stye is characterized by an erythematous, tender and painful swelling which appears at the margin of the eyelid. The swelling enlarges until suppuration, pointing and rupture of the pustule occur and a small amount of pus is discharged. An associated blepharitis is usually present.

Management consists in the use of hot compresses of isotonic saline solution to hasten suppuration. When the stye is mature a horizontal incision should be made or the hair contained in the follicle should be extracted. Broad spectrum antibiotic ophthalmic ointments, prescribed as such or in combination with other antibiotics such as Baciguent Ophthalmic Ointment, Bacimycin Ointment Ophthalmic or Ilotycin Ophthalmic Ointment are useful. These may be applied to the stye one or more times daily.

When styes recur a general physical check-up is indicated so that treatment can be directed at whatever underlying condition is discovered.

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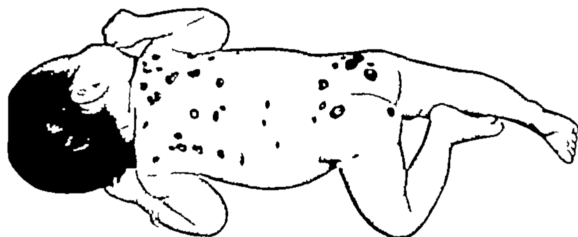


Fig 72 (top).—Pyoderma gangrenosum in a 7 week-old girl Discrete patches of necrosis began as a papulopustular rash on the chest and back apparently secondary to a bilateral suppurative otitis media. Culture revealed Pseudomonas aeruginosa (By permission from Kohlenbrener R. M Boehm, J J and Falk A B A.M.A J Dis. Child 96 741 743 Dec. 1958)

Fig 73 (bottom) —Pyoderma gangrenosum in a boy 1 years of age Note the ulcerati e ecthymatous lesions. *(Courtesy of Dr John C Belisario Photography by Mr Woodward Smith Department of* Artistry University of Sydney)

Streptomycin

Weight of patient less than 5 kg. dosage	0.3 Gm.	Given intramuscularly daily. May later be reduced to three times weekly
5-9 kg.	0.4 Gm.	
10-18 kg.	0.5 Gm.	
18-?7 kg.	0.75 Gm.	
40 kg. and over	1.0 Gm.	

OR 1 Gm. per sq. meter of body surface.

Isoniazid

5-?0 mg./kg. daily by mouth. (Maximum 400 mg.) Divide into two doses per day. Or ?00-400 mg. per sq. meter of body surface.

Para-aminosalicylic Acid

0.2-0.5 Gm./kg. daily by mouth. (Maximum 12 Gm.) Divide into 3 or 4 doses per day. Or 8-12 Gm. per sq. meter of body surface.

Promizole

Begin with 0.5 Gm. per day divided into 4 doses. Adjust dose so that blood level (2 to 3 hours after administration) equals 1 to 3 mg. per cent. Administer 3 doses per day after patient has left the hospital.

TABLE 17.—THE TUBERCULIN REACTION, CLINICAL SIGNS AND HISTOLOGIC CHARACTERISTICS IN CUTANEOUS FORMS OF TUBERCULOSIS

Type of Disease	Clinical Signs	Histologic Characteristics	Tuberculin Reaction
		LOCALIZED TYPES	
Lupus vulgaris	Apple-jelly nodules. Dark red coalescing nodules forming plaques on face, nose, ears, etc.	Tubercles only in the subcutis at times. Tubercles plus inflammatory reaction in any part of the cutis, more specifically in the subcutis	Hypersensitive
Tuberculosis verrucosa cutis	Solitary verrucous patches on dorsum of hands occurring in tuberculous subjects, prosectors, etc.	Tubercles with inflammatory process and granulation tissue with marked epithelial changes	Hypersensitive
Tuberculosis cutis orificialis	Ulcerations of mucous membranes or skin of orifices	Tubercles with inflammatory process and granulation tissue with marked epithelial changes	Anergic
Scrofuloderma	Ulcerations of the skin overlying lymph nodes	Tubercles with inflammatory process and granulation tissue in the subcutis with ulceration and sinus formation	Hypersensitive
Primary tuberculous complex	Ulceration at site of inoculation, with lymphangitis and lymphadenitis and fever	Characteristic tuberculous histology with finding of tubercle bacilli	Hypersensitive
		HEMATOGENOUS TYPES	
Acute miliary tuberculosis	Widespread purpuric or papular eruption occurring in terminal stage of general miliary tuberculosis	Tubercle formation and demonstration of tubercle bacilli in lesions	Negative

(continued)

6

Cutaneous Forms of Tuberculosis

THERE ARE SEVERAL acceptable classifications of tuberculous lesions of the skin. For the purpose of this book the author has followed that of Gans, who divides them into two main types, localized and hematogenous. The *localized* types are lupus vulgaris, tuberculosis verrucosa cutis, tuberculosis cutis orificialis, scrofuloderma, and primary tuberculous complex. The *hematogenous* types include acute miliary tuberculosis, lichen scrofulosus, papulonecrotic tuberculid, erythema induratum of Bazin, sarcoidosis and granuloma annulare. (The question of whether the latter is really of tuberculous origin is as yet unanswered.) Three other hematogenous types—the rosacea like tuberculid of Lewandowsky, lupus miliaris disseminatus faciei and lupus pernio—are almost never seen in children.

The lesions of the skin caused by the tubercle bacillus and their products are known as tuberculomas. The skin manifestations may vary widely depending on the type of lesion and the immunologic reaction. Some of the lesions, for example those of miliary tuberculosis, which sometimes follows measles, are seen almost exclusively in children. On the other hand lichen scrofulosus practically never occurs after the second decade of life.

Skin tuberculosis is seen more commonly in European countries than in the United States. This difference is probably due to the better living conditions here, particularly the more adequate diet including vitamins. In this country most children with tuberculosis of the skin are found among immigrant stock.

Diagnosis.—The tuberculin reaction is of inestimable value in diagnosis. Of lesions present in 258 tuberculin-positive children under 5 years of age Cammock and Miller found primary lesions (on clinical or radiologic evidence) in the chest of 180, abdomen of 6, cervical glands of 15 and skin of 2 patients. The types of reaction occurring in the various cutaneous forms of tuberculosis are summarized in Table 17 along with the clinical signs and histologic characteristics.

Treatment.—Regarding the use of modern therapeutic remedies in the management of tuberculosis of the skin, most authorities are in agreement with Sulzberger and Baer, who feel that no hard and fast rule can yet be laid down as to the best treatment. Isonicotinic acid hydrazide, para-aminosalicylic acid, thiosemicarbazone, streptomycin and calciferol all are effective in varying degrees in some or many or most cases, but the supreme therapeutic agent for cutaneous tuberculosis is still to be developed.

The following dosage schedule for antimicrobial agents in the treatment of cutaneous forms of tuberculosis is that recommended in the 1957 Report of the Committee on the Control of Infectious Diseases of the American Academy of Pediatrics.

offender insofar as frequency and severity of side effects and the development of treatment resistance are concerned. Boyd and his colleagues treated 50 cases of childhood tuberculosis with isoniazid, using 3 mg./kg. of body weight at first, increasing to 10 mg. later and maintained the latter dosage from two to four months without toxic symptoms in most patients. The dose was reduced to 5 mg./kg. at the end of that time, or sooner if anorexia developed. Leider and Sawicky in reporting their results from treatment of 33 cases of various dermatologic conditions, mainly tuberculomas, with Rimifon (isonicotinyl-hydrazine) concluded that tuberculosis cutis luposa (lupus vulgaris) tuberculosis cutis indurativa (Bazin's disease) and tuberculosis cutis colliquativa (scrofuloderma) responded favorably and lupus erythematosus and sarcoidosis did not respond to this chemical. Most of the patients received daily doses of 2–4 mg./kg. of body weight per day for periods varying from one to seven months. Most of these patients were adults.

Ward has reported improvement in two children with chronic disseminated tuberculosis who were treated with streptomycin and para-aminosalicylic acid. One, a 4-month-old boy received 250 mg. of streptomycin and 5 Gm. of PAS daily for six months with spectacular improvement. The other patient, 2 years of age, received streptomycin, 0.5 Gm. b.i.d., PAS 7 Gm., daily for one month with definite improvement.

Calciferol (vitamin D_2) has been used in the treatment of some forms of cutaneous tuberculosis (lupus vulgaris and scrofuloderma) with encouraging results. Dowling states that the effective daily dose for an adult appears to be in the neighborhood of 100,000 I.U. daily after an initial month or a little longer on a larger amount. In children the dose should be based on body weight. Available Calciferol U.S.P. preparations include capsules, 50,000 U.S.P. units (1.25 mg.) tablets, 50,000 U.S.P. units, and oral drops, 250 U.S.P. units in 1 drop. Calciferol may be prescribed alone or alternating its use with streptomycin. (For untoward effects from calciferol, see under Granuloma Annulare, p. 228.)

LOCALIZED TYPES

Lupus Vulgaris

Lupus vulgaris is a destructive type of tuberculosis of the skin which often leaves in its wake disfiguring scars. While any part of the body may be affected, the face is particularly prone to be the site of this infection, especially the skin around the ears and nostrils.

Etiology.—Lupus vulgaris is a disease of young life occurring in childhood and the teens. The disease is more common in girls than in boys. Close contact with members of family or with persons having active tuberculosis serves as an atrium for the infection.

Clinical Picture.—The primary lesion appears as a small, subcutaneous nodule. If the skin in this area is examined under diascopic pressure, using a glass slide to deblematize the area, the lesion will be found to appear as a number of small nodules, of a golden brownish color which has been compared to apple jelly. Other nodules soon appear to form a small or large, purplish or reddish-purple plaque. The lesions tend to extend peripherally, discrete lesions coalescing to form one large plaque. Ulceration in the center follows. Healing occurs very slowly and leaves disfiguring scars (Fig. 74). Constitutional symptoms are seldom present.

Diagnosis.—The indices are small subcutaneous nodules, slowly enlarging and extending peripherally, having an apple jelly appearance under diascopic pressure and followed by ulceration and scar formation. The face is a favorite site.

Another test is provided by *inserting the end* of a toothpick into one of the nodules; it will readily penetrate the nodule and remain there. The tuberculin test is strongly positive, even in high dilution.

Lupus vulgaris can be differentiated from *syphilis* by serologic test, and, in difficult cases, by biopsy. If a *cicatrizing epithelioma* which sometimes simulates lupus vulgaris, must be

TABLE 17—THE TUBERCULIN REACTION, CLINICAL SIGNS AND HISTOLOGIC CHARACTERISTICS IN CUTANEOUS FORMS OF TUBERCULOSIS (*cont.*)

Name of Disease	Clinical Signs	Histologic Characteristics	Tuberculin Reaction
Lichen scrofulosus	Small pinhead-sized papular eruption appearing mainly on the trunk in children	Tubercle plus inflammatory process without necrosis occurring in the papillary zone. Process is superficial	Hypersensitive
Rosacea-like tuberculid of Lewandowsky	*Resembles rosacea in distribution and clinical appearance. Face is erythematous and studded with* small pinhead-sized apple jelly nodules	Tubercle with inflammatory process	Hypersensitive
Papulonecrotic tuberculid	Papules, many of which have ulcerated. Usually appearing in crops on extremities	Inflammatory process with necrosis without suggestion of tubercle formation	Hyposensitive
Erythema induratum of Bazin	Deep nodules and some ulcers occurring on dorsal aspects of lower extremities in young women. Lesions in different stages of evolution and involution	Usually tubercles, plus nonspecific inflammatory reaction in the subcutis. Also necrosis	Hyposensitive
Lupus miliaris disseminatus faciei	*Apple jelly* nodules appearing on eyelids, lips, and nasal orifices, mostly in Negresses	Tubercles and inflammatory process simulating lupus vulgaris	Hyposensitive
Sarcoid of Boeck	Reddish-brown, discrete elevated, smooth superficial plaques distributed over face and extremities	Tubercle formation primary in the cutis without any other pathologic process	Hyposensitive (positive reaction)
Sarcoid of Darier Roussy	Subcutaneous small nut-sized nodules. Sometimes they ulcerate. Usually found on extremities	Tubercle formation primary in the subcutis without any other pathologic process, as in lupus pernio	Hyposensitive
Lupus pernio	Symmetric purplish lesions of face, nose, ears, toes and fingers, simulating *frostbite. Sometimes ulcer*ations, often associated with lupus vulgaris	Tubercle formation in the subcutis without other pathologic process. Simu*lates the deep type of sar*coid	Hyposensitive

Practically never seen in children.
(From Cipolarro, Anthony C.: New York J. Med. [illegible] 11, no. 14, [illegible] 15, 1911.)

Many children experience difficulty in taking para-aminosalicylic acid over a long period or in large doses. In such cases, it is best temporarily to *discontinue the drug and begin* later with a smaller dose gradually increasing until *tolerance* develops. If the dose of Promizole is regulated by blood levels, it is usually well tolerated.

Duration of antimicrobial therapy varies with the severity of the disease and the progress of the patient. The present trend is to continue therapy for a year or longer. Therapy should usually be continued six months after clinical improvement, stabilization of the lesions and sterilization of the lesions occur.

Streptomycin seems to be the most frequent

ruled out, histopathologic examination of the lesions will settle the question. Epithelioma is seldom seen in children.

Prognosis.—Healing of the lesions is slow and is followed by scar tissue. Scar tissue, by reason of contraction causes unsightly deformity and disfigurement. Recurrences may follow.

Treatment.—When a diagnosis of lupus vulgaris has been established, other members of the family should be examined for evidence of infection. A careful examination of the patient himself should be made for the presence of other lesions, particularly in the lungs, and roentgenologic examination of the chest should be ordered routinely. In general, the patient's resistance should be improved by adequate rest and life in the open, with an abundance of sunshine and high caloric vitamin diet.

Isonicotinylhydrazine (Rimifon) should be given in doses of –4 mg./kg. of body weight per day and continued for several months. Calciferol must be continued for several months before worthwhile results are seen; meanwhile the urine should be examined frequently and blood serum calcium determination made. Streptomycin should be reserved for recalcitrant cases. Good results have followed combined treatment with streptomycin and calciferol. Small lesions may be excised.

See also Treatment, p. 14

Tuberculosis Verrucosa Cutis

Etiology.—Tuberculosis verrucosa cutis is rare in children. It occurs in those persons who, in their trades or professions, handle tubercular carcasses. On the other hand, lesions may also occur independently in persons who have tuberculosis or who are exposed to someone with the active disease.

Clinical Picture.—The lesions are usually located on the dorsal surfaces of the fingers and hands. The initial lesion consists of small, wart-like papule which soon becomes a pustule. A single lesion may be present or numbers may be found; often the lesions coalesce to form plaque. The exudate dries to form crusts. Fever may be present or absent.

Diagnosis.—Diagnosis is made by finding a thickened slowly growing wartlike lesion covered with a crust or extending to form a plaque. It is persistent, of a purplish or reddish color usually on the dorsum of the hands or fingers. The common wart may be mistaken for the condition, but verruca vulgaris does not have the peripheral infiltration of tuberculosis verrucosa cutis.

Treatment.—Treatment consists in destroying the lesions by means of surgical excision, surgical diathermy or roentgen ray therapy. Ultraviolet irradiation is beneficial. See also page 214.

Tuberculosis Cutis Orificialis

(Tuberculous Ulcers)

As the name implies, this type of tuberculosis occurs at the orifices of the body: the circumoral area, nostrils, anal orifice and urethral meatus. The condition occurs in a person with active visceral tuberculosis and is due to contact with his own secretions or excretions. Apparently the area affected has poor or no resistance and so is unable to destroy the tubercle bacillus.

A small nodule or miliary lesion first appears, which coalesces with other nodules in close proximity and, necrosis following, leaves an oval, round, sluggish, granulating ulcer or a series of ulcers with a seropurulent discharge. The lesions on the tongue are painful. The tuberculin reaction is negative.

Roentgen therapy has been used and temporary improvement has resulted, but the prognosis is poor.

Scrofuloderma

(Tuberculosis of the Lymph Nodes)

Scrofuloderma is not nearly as common today as it was decades ago. This reduction is probably due to the measurable eradication of bovine tuberculosis, the use of pasteurized milk, improved living conditions, prophylaxis and sanatorium care for tuberculous patients with open lesions.

Clinical Picture.—The condition, usually starting in childhood, is characterized by a small nodule of violaceous or purplish hue. In the classical picture one or several enlarged cervical



Fig 74—Lupus vulgaris. **A**, of one year's duration in a boy 11 years of age **B** in a girl 8 years of age who also had scrofuloderma and pulmonary tuberculosis with bone changes characteristic of tuberculosis Note the widespread area of skin destruction and atrophy of the skin **C**, in a child 10 years of age. Note the extensive destruction of the skin X-rays showed tuberculosis of the lungs Tuberculous dactylitis and scrofuloderma also were present **D** ulcerative lupus showing scarring, the end result of extensive destruction of the epidermis and corium. Active lupus nodules are still to be seen on the right cheek and a new nose after plastic surgery (*A B* and *C* courtesy of Dr Meyer L. Niedelman *D* courtesy of Dr R. M Bolam Skin Department, Royal Victoria Hospital Newcastle upon-Tyne.)

complex of tuberculosis, which is equivalent of the Ghon tubercle in the lung and other internal organs, and the inoculation forms of tuberculous lesions, which appear on the skin of a person who already has or has had tuberculosis. Accordingly the term primary cutaneous complex is applied to those cases in which a primary lesion of the skin with a negative tuberculin reaction and no evidence of systemic tuberculosis is followed later by lymphangitis



Fig. 76.—Primary tuberculosis. A, scab on the face and soft gland at angle of jaw six months after the infection in child 12 months of age with active primary tuberculous lesion. B, same child showing healed primary tuberculous lesion. (By permission from Miller F J W Lancet 1 99 Jan. 3 1953)

nal enlargement of the adjacent lymph nodes, together with a positive reaction to the tuberculin test, with or without evidence of systemic tuberculosis.

Etiology.—Primary cutaneous complex is particularly common in children, although it has also been reported in adults. The lesion may occur on the face from kissing by a tuberculous person. Again, other areas, such as the extremities and external genitalia (from ritual circumcision) may be primary sites. Insect bites also have been incriminated.

Clinical Picture.—The primary lesion consists of a small papule marking the site of entrance of the tubercle bacillus. The papule, enlarging slowly frequently breaks down to form an ulcer (tuberculous chancre) (Fig. 76) Enlargement of the regional lymph nodes follows shortly thereafter Any part of the skin may be affected.

Symptoms indicative of early tuberculosis due to constitutional involvement are loss of appetite, malaise, tiredness, fatigue and a slightly elevated temperature. The tuberculin reaction, which at first is negative becoming positive only after several months, is of little help for early diagnosis. After several weeks or a month, the lesions heal, leaving a scar

Diagnosis.—Absolute *identification* of primary tuberculosis of the skin demands not only histologic and bacteriologic proof of the tuberculous nature of the lesion, but also evidence of primary infection. The tuberculous nature of the cutaneous lesion can be verified, of course with the aid of biopsy smear or culture. The fact *that the lesion is primary is admittedly difficult* to prove, and indeed *may be overlooked*. Furthermore, by the time the adenopathy is present, the tuberculin test will already have become *positive*. Accordingly let it be repeated the initial lesion *in its earliest stages* does not reveal the *clinical* characteristic of tuberculosis

glands soon appear as firm or doughy swellings. These enlarged glands may have been noticed for months or years. They gradually enlarge sometimes attaining the size of a hen's egg. As the swelling enlarges the glands become matted together and adherent to the overlying skin, which at the same time reddens. Finally the mass becomes fluctuant and the overlying skin breaks down to form an ulcer with the glands discharging pus that leave draining sinuses. The lesion is usually localized on one side of the



Fig 75.—Scrofuloderma in a young boy. The tuberculous sinuses are secondary to the tuberculous testes. (Courtesy of The Children's Hospital Philadelphia.)

neck. Other areas may be involved (Fig. 75). Instead of the lymph nodes, other areas of the skin overlying tuberculous bones joints or subcutaneous tissue may be affected. The tuberculous process in those structures by direct extension to the skin results in necrosis with a subsequent discharge of seropurulent fluid through fistulous tracts or sinuses.

As a rule the condition is painless but tenderness may be present. The lesions heal slowly leaving linear and irregular scars some of them disfiguring. As a rule there are no subjective symptoms, although just before the glands break down there may be a slight elevation of temperature and some local discomfort.

Diagnosis.—Early in the course of cervical tuberculous adenitis, *diagnosis is difficult because* the gland, although it is discrete is without evidence of inflammation. Accordingly it is difficult to distinguish it from a gland enlarged from pyogenic infection or some form of malignant disease. Later the diagnosis of cervical tuberculous adenitis is less difficult.

A diagnosis of tuberculous cervical adenitis may be made when a child has unilateral, matted nontender cervical glandular swelling of six weeks duration or more and a positive intracutaneous tuberculin test. A history of contact with tuberculosis or the ingestion of raw milk is further evidence helping to confirm the diagnosis. The condition should be differentiated from syphilitic glands, actinomycosis, lymphosarcoma and Hodgkin's disease.

Differential Diagnosis.—In *syphilitic gummata* there are other signs of syphilis and blood serologic reaction is positive. *Actinomycosis* is rare in children. The ray fungus may be demonstrated in fresh preparations and in cultures. In difficult cases biopsy and histopathologic study will disclose the characteristic picture; and the therapeutic test with potassium iodide will settle the diagnosis. In *lymphosarcoma* the large glands are *usually bilateral* also they occur in the inguinal and axillary regions. The *glands are discrete but not adherent* to the overlying skin and deeper structures. The spleen is often enlarged. The tuberculin test is usually negative. In *Hodgkin's disease* the enlarged cervical glands are bilateral and other glands may also be affected. The glands are discrete and are not matted together as in tuberculous adenitis. The overlying skin remains free. Biopsy may be indicated in difficult cases.

Treatment.—The best treatment for scrofuloderma when the lymph glands are involved consists in surgical excision of the affected nodes. When there is evidence of suppuration, incision and drainage are called for. Roentgen-ray therapy and ultraviolet irradiation are both valuable. *Isonicotinylhydrazine in* dosage of 2–4 mg./kg. of body weight should be given *by mouth and continued* for several months.

See also Treatment p. 214

Primary Cutaneous Complex

(Primary Tuberculous Complex, Primary Tuberculosis of the Skin)

Montgomery and Helmolz have emphasized the difference between the primary cutaneous

grouped on the trunk, are characteristic. The tuberculin test is positive and biopsy will disclose the histopathologic picture of a typical tuberculous structure.

Lichen nitidus may closely simulate lichen scrofulosorum, but the lesions are as common on the extremities as they are on the trunk in



Fig. 77.—Lichen scrofulosum in a boy 5 years of age. Note the large number of minute keratotic follicular papules (resembling keratosis pilaris) distributed over the posterior region of the trunk. The lesions may be arranged in [illegible] groups. The child had tuberculous lymph nodes and a Ghon tubercle as revealed on chest x-ray. (Courtesy of the Children's Hospital, Philadelphia.)

lichen nitidus and are also found on the shaft of the penis and lower half of the abdomen. Biopsy will decide the diagnosis in [illegible] difficult cases.

The condition clears spontaneously.

Local treatment with the newer tuberculocidal remedies should be attempted. The patient's general health should be improved if necessary. Generalized exposures to ultraviolet light are helpful.

Papulonecrotic Tuberculid

The papulonecrotic tuberculid lesions occur as small indolent granulomas representing the cutaneous reactions caused by bacillary embolisms from lesions in the viscera. The reactions resulting from those products (tubercle bacillus and its toxins) vary greatly dependent on the degree and the kind of allergy present in the individual.

Typical lesions vary from the size of a pinhead to a small pea. They are firm, discrete, appearing as follicular papules or nodules. They appear in showers or successive crops (Fig. 78). They are distributed bilaterally and symmetrically and are usually found on the extensor surfaces of the extremities, on face and trunk, in children and young adults afflicted with chronic tuberculosis elsewhere. On palpation the lesions are found to consist of firm, painless and isolated papules or nodules. They soon undergo central necrosis, heal spontaneously and leave pitted scars. The lesions may be grouped, and not infrequently two or more of the various types of tuberculids may be seen at the same time (for instance papulonecrotic tuberculids may occur with erythema induratum). On the other hand, they may be found in association with other cutaneous manifestations of tuber culosis. Papulonecrotic tuberculids have a tendency to recur; indeed, until the introduction of isoniazid they were found to be resistant to therapy.

The clinical picture as given above is characteristic. Proof of the existence of tuberculosis elsewhere on the body is helpful in reaching a diagnosis. The tuberculin reaction is positive.

Papulonecrotic tuberculids may recur over a period of years but can be controlled by isoniazid.

Treatment.—The general health of the patient should be improved and treatment should be attempted with one of the modern tuberculocidal agents. A high caloric, high vitamin diet, with adequate rest and those measures generally applicable in the treatment for other types of tuberculosis, should be followed. The remedies of choice are isoniazid and streptomy

and, after an ulcer forms, may simulate a syphilitic chancre, pyoderma, furuncle or spirotrichosis The history of contact with a person who has active tuberculosis is helpful The indolent character of the lesion, beginning as a papule which spreads slowly and ulcerates and then heals leaving a scar is characteristic There is an associated regional lymphadenopathy also which is strongly suggestive of the condition. Results of the intradermal tuberculin test are negative at first but become positive after several weeks or months The condition should be differentiated from acquired syphilis sporotrichosis pyoderma and furuncle

Differential Diagnosis.—Differentiation from the chancre of *acquired syphilis* can be settled at once by a darkfield examination and an examination of the serum obtained from the lesion In *sporotrichosis* the nodule or ulceration is not followed by lymph node enlargement. Culture of the lesion will disclose the causative fungus. In *pyoderma* the lesion consists of a superficial crust or crusts which are yellowish, waferlike, stuck-on the skin and with exudate. Soon the primary lesion is followed by other areas of involvements. The *furuncle* is hard and inflamed and has a central core.

Prognosis and Treatment—The prognosis is good spontaneous cure is the rule Treatment consists mainly in the use of supportive measures When the lesion is discovered, early surgical excision and localized and generalized exposures to ultraviolet light are of benefit. Streptomycin and isoniazid hydrazide should be tried. Roentgen therapy is considered one of the best treatments after excision of the primary lesion and the regional lymph nodes. It should be administered by a qualified radiologist.

HEMATOGENOUS TYPES

Acute Miliary Tuberculosis

Acute miliary tuberculosis is a disseminated type of disease occurring almost exclusively in infants and children. However it is seldom seen. The widespread infection follows debilitating diseases and exanthemata such as measles and scarlet fever It is found most frequently in impoverished infants and children

Clinical Picture—The lesions consist of papules vesicles papulovesicles, pustules and crusts of a purplish color distributed over the trunk and the extremities. A septic type of fever not uncommonly occurs The condition is accompanied by a rapid loss of weight and is followed by inanition and death.

Diagnosis.—Diagnosis is made from the clinical picture already described. Usually but not invariably the condition follows a debilitating disease such as measles It may be secondary to pulmonary tuberculosis The tuberculin test is negative. *Roentgenologic examination* may disclose generalized tuberculosis of other organs.

Complications and Prognosis.—Tuberculous meningitis may follow and cause death The disease is almost invariably fatal.

Treatment.—Anti-tuberculosis drugs, such as streptomycin, para-aminosalicylic acid isoniazid should be given a trial. See page 214

Lichen Scrofulosus
(Lichen Scrofulosorum)

This type of tuberculosis occurs in young children and young adults. It, too is considered a tuberculid Its lesions are found chiefly on the trunk less often on the extremities.

The lesions consist of groups of tiny flattened papules pinhead in size, only slightly elevated above the skin surface. Nummular grouped lesions may be found on the trunk and on the extremities Their color is that of normal skin although at times they have a slight reddish tinge Some of the lesions may be covered by a slight scale (Fig 77) They are found most commonly in the region of the hair follicles and not unlike the papulonecrotic tuberculid may appear suddenly and disappear spontaneously but leave no scars.

A history of tuberculosis in the family may be elicited or the patient may have other foci of tuberculosis such as hilar tuberculosis of the lungs The minute pinhead-size lesions, often

and, of course, it responds to antisyphilitic therapy. In difficult cases, biopsy will settle the diagnosis.

In toxicoderma from *iodides* or *bromides* history of the ingestion of such drugs may be elicited and blood examination and urinalysis are helpful.

Prognosis.—Scar tissue may cause considerable disfigurement.

Treatment.—Whenever possible, the patient should remain in bed with the limbs elevated. Supportive measures, such as elastic bandages, Ace bandages or an occlusive dressing, are helpful. In general, an effort should be made to improve nutrition by means of a high caloric, high vitamin diet, as in other forms of tuberculosis. Roentgen therapy and localized exposure to ultraviolet light are helpful. See also page 14



Fig. 79.—Erythema induratum of Bazin of three years duration in young girl. Note the symmetrical healed lesions (or scars) and bluish discoloration on the posterior aspects of the lower part of both legs. This patient had pulmonary tuberculosis.

Sarcoidosis
(Boeck's Sarcoid)

In 1899 Boeck first described this condition, in which the cutaneous lesions simulate sarcoma and leukemic conditions of the skin. It is known also as benign lymphogranulomatosis, Besnier-Boeck disease, Besnier-Schaumann-Boeck's disease, Hutchinson-Boeck's disease, lupus pernio, uveoparotid fever, Mortimer's malady and benign miliary lupoid.

Sarcoidosis is a specific chronic infectious disease of unknown etiology producing characteristic lesions distinguishable from other infectious granulomas such as tuberculosis and syphilis. It is a systemic constitutional disease with particular predilection for the skin, liver, spleen, kidneys, lungs, bones, eyes, brain and meninges. No organ is exempt from the infection.

Two main types are recognized: (1) sarcoid of Boeck, which is superficial and begins in the epidermis, and (2) sarcoid of Darier-Roussy, which begins in the subcutaneous tissues and invades the epidermis secondarily. The sarcoid of Spiegler-Fendt is now considered to belong to the lymphoblastoma group of diseases.

Etiology.—The disease is more common in adults and, although it is rarely seen in infants and children, it may occur at any age. No race is exempt but the ailment is seen especially in Negroes and in dark skinned persons. Females are supposedly more frequently afflicted than males. Several instances of sarcoidosis have been reported in identical twins.

The exact cause is unknown but various theories have been advanced. One theory postulates that sarcoidosis is an anergic form of tuberculosis because individuals with it prove highly resistant to the tubercle bacillus. Other investigators have reported the finding of an acid-fast bacillus in the skin lesions and in scrapings of the nasal mucous membranes.

Boeck, Schaumann and others are proponents of the theory that the disease is a manifestation of tuberculosis. Because Koch's postulates have never been verified, it is assumed that the tubercle bacillus is destroyed by anticutin—a substance which neutralizes the acid-fast bacillus. This theory is in keeping with Jadassohn's theory of anergy, in which there is a lack of skin sensitiveness to the tubercle bacillus. Old tuberculin injected intradermally in

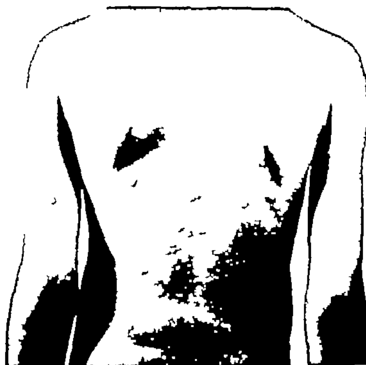


Fig 78.—Papulonecrotic tuberculids in a girl 5 years of age who also had the nodosa type of tuberculosis indurativa of both lower extremities. Strongly positive reaction obtained with 0.001 mg tuberculin test. (By permission from Bernstein, J C Am. J Dis Child 57 1 60-1271 June 1939)

cin They are at present preferred to calciferol. See also page 214

Erythema Induratum of Bazin

(Tuberculosis Cutis Indurativa)

Erythema induratum was first described by the French dermatologist Bazin A chronic form of tuberculosis, it is also a tuberculid, although the lesions are larger than those seen in the papulonecrotic tuberculids. The condition is seen most frequently in young females whose occupation requires them to be on their feet much of the time. The disease is characterized by recurrences A history of tuberculosis in other members of the family is frequently elicited. On examination, other foci of tuberculosis may be found such as hilar tuberculosis of the lungs or glandular tuberculosis of the lymph nodes

Clinical Picture—The areas of predilection are the posterior aspects of the legs. Small, tender nodules first appear beneath the skin these, which gradually enlarge, become soft and are of a purplish or reddish color (Fig. 79) The over lying skin becoming necrotic, ulceration follows Healing occurs slowly leaving scar tissue. Not infrequently active areas of the disease may be found over healed lesions on the calves so that both scars and active nodules may be seen at the same time.

Occasionally the arms instead of the legs may be affected or lesions may appear there simultaneously with lesions on the calves. Only rarely are lesions found elsewhere. The condition is painless and is unaccompanied by constitutional symptoms.

Diagnosis.—The diagnosis is made from the clinical picture. A history of tuberculosis in the family or tuberculous foci elsewhere is often helpful The tuberculin test is negative. Erythema induratum should be differentiated from erythema nodosum syphilitic gummata and toxicoderma due to iodides and bromides.

Erythema nodosum is acute or subacute. The lesions appear more rapidly than in erythema induratum, are limited to the anterior aspects of the legs, are painful and tender and never ulcerate but involute without leaving scars. *Syphilitic gummata* can be differentiated by a positive history of syphilis and by blood serologic tests. The lesion in syphilis is unilateral

Complications.—Diabetes insipidus from pituitary involvement; myxedema when the thyroid is involved, and extensive pulmonary sarcoidosis may lead to polycythemia vera or cor pulmonale. Seventh nerve paralysis, unilateral or bilateral, may follow the parotitis. Paralysis of the soft palate, intercostal neuralgia, paralysis of the vocal cords, ptosis, deafness and polyneuritis are other complications. The common eye complications include conjunctivitis, vitreous hemorrhage, optic neuritis, neuroretinitis, chorioretinitis, glaucoma and cataracts. Healing in some cases may leave scars and synechiae. The sight may be destroyed.

Prognosis.—Prognosis is generally good, with spontaneous recovery being the rule. Relapses may recur. The disease is rarely fatal. Lesions heal by fibrosis leaving atrophic scars. It has been estimated that approximately 10 per cent of patients develop clinical tuberculosis. The mortality rate has been reported as 5 per cent.

Treatment.—There are no known specific remedies for sarcoidosis although recently considerable interest has been aroused by the use of ACTH and cortisone in the treatment of sarcoidosis in adults, and these remedies may have temporary value. Leider and Sawicky in a survey of tuberculomas, found that isonicotinyl-hydrazine (Rimifon) did not cause improvement in patients treated for sarcoidosis.

Sarcoid of Darier Roussy

This type of sarcoid is infrequently seen in infants and children. The clinical picture consist of deeply situated lesions which appear mostly as nodules. The overlying skin may be of normal color or purplish. The lesions may involute or ulcerate after weeks or months and, like those of Boeck type, may be found anywhere on the skin, in the lungs, the lymph nodes or in compact bones. The tuberculin reaction is negative.

Roentgen therapy is the best treatment. Patients with this type of sarcoid do well with arsenic, as for example Fowler solution, beginning with 1 minim, well diluted, three times daily and increasing the dose to the point of tolerance.

Granuloma Annulare

(Ringed Eruption, Lichen Annularis)

Granuloma annulare is a chronic inflammatory disease characterized by ringed papular or discrete nodular lesions, usually found upon the dorsum of the hands and feet.

Two types are seen (1) the typical discoid, ring shaped lesion with a firm nodular border, (2) the disseminated type consisting of discrete, hard, infiltrated nodules, pea-sized and widely disseminated, usually upon the extensor surfaces of the extremities.

The exact cause is unknown. It is probable that this disease, not unlike sarcoid, represents a clinical response to various agents or toxins reacting upon susceptible tissue in the corium.

Although microscopic examination may disclose a tuberculous structure—i.e., giant cells and epithelioid cells—this evidence of tuberculous activity is often absent. Accordingly the tuberculous origin of granuloma annulare has not been definitely established. Furthermore, in most cases the tuberculin reaction is normal that is, it provides no evidence of hypersensitivity to tuberculin.

Clinical Picture.—THE RINGED LESIONS.—The most common site of the discoid, ring shaped lesions is the dorsum of the hands and lateral aspects of fingers and in front of and behind the ears; less frequently they occur on the dorsal surfaces of the feet. The forearms, knees and buttocks may also be involved. (See Figs. 80 *A* and *B*.)

The condition begins as a single infiltrated papule the size of pea and slowly extending peripherally. The lesion when fully developed is the shape of a coin, varying in size from a quarter to a half-dollar or larger. On close examination the margin of each lesion appears to consist of a solid border of nodules which are quite hard and firm, or perhaps slightly doughy and slightly elevated above the skin surface. At times the border is broken up into segments separated by small areas of normal epidermis. The central portion of the ringed lesion is usually slightly depressed. The skin of this area may be either atrophic or normal and may vary in color from normal to slightly pink, violaceous, or even yellow (waxy). Merging of two or

concentration even as high as 1 100 results in only a faint reaction or a negative reaction. However it is well known that patients with sarcoidosis may develop active pulmonary tuberculosis. In these persons the skin manifestations of sarcoidosis disappear and the once feeble or negative tuberculin reaction become strongly positive—that is, a change occurs from a negative to a positive reaction (positive allergy) Other investigators have postulated that a mycobacterium somewhere between tubercular and leprosic organisms is responsible for sarcoidosis a third group believes that the disease is due to an undiscovered virus.

Clinical Picture.—As has already been stated sarcoidosis is a systemic constitutional infection in which skin manifestations occur in approximately 50 per cent of patients. Equally important, however and helpful in diagnosis, are the clinical signs and symptoms of other organs. Lymphadenopathy also occurs in about 50 per cent of patients

Skin lesions consist of papules, nodules and infiltrating plaques. The papules are firm or elastic, round or oval-shaped 1 5 mm in diameter and are red, brown or violaceous. They are located chiefly on the face, back of the shoulders and neck and the extensor surfaces of the arms. Papules should be looked for especially around the eyelids and nose. Nodules may be seen instead of papules. On the other hand the lesions may appear in the form of thickened and diffusely infiltrated plaques over the face, nose and ears resembling lupus pernio In these instances the skin may appear bluish with tiny yellowish granules at the edges of the lesions Again the lesions may be dry slightly scaly or covered with crusts. As they grow older they may become darker finally disappearing entirely and in some instances, leaving an atrophic scar When diascopic pressure (with a glass slide) is applied to the lesions, they are seen to consist of tiny yellowish papules (miliary lupoid) Interesting is the fact that the lesions never ulcerate and break down as occurs in lupus vulgaris nor do the lesions itch

Lymphadenopathy is another feature of the disease The enlarged glands are painless, quite firm and discrete or have a rubbery (elastic) feel The lymph glands usually involved are those of the submental chain, the pre- and postauricular and epitrochlear nodes.

Eye involvement (the uveoparotid syndrome) may occur Uveoparotid fever was first described by Keerfordt in 1909 as a mildly febrile illness producing uveitis, with a swelling usually affecting both parotid glands and accompanied frequently by facial palsy Although all the structures of the eye may be involved, keratitis and iridocyclitis (uveitis) constitute the important lesion. Before involvement of the eye a painless bilateral swelling appears over the parotid glands, followed by iritis or iridocyclitis. The signs are often preceded by lassitude, malaise and symptoms referable to the gastro-intestinal tract. An intermittent fever (not over 102 F) sometimes occurs.

Bone changes also may occur The phalanges metacarpals and metatarsals are frequently affected, in fact the lesions here are quite characteristic of the disease. Swelling of the soft tissues of the terminal phalanges may give a spindle shape to the fingers. So affected they resemble clinically tuberculous dactylitis.

Diagnosis.—Diagnosis is made by clinical evidence of the skin lesions, a careful survey of the signs and symptoms affecting other organs, by a roentgenologic examination of the lungs, long bones especially of the hands and fingers, by laboratory findings and by microscopic examination of skin lesions and lymph nodes.

KVEIM TEST —This test consists of the injection of 0 1-0.2 cc. of an antigen prepared from sarcoid tissue from lymph nodes, ground up and suspended in a sterile salt solution with 0.5 per cent phenol. The suspension is injected intracutaneously and if a reddish-brown papule appears, usually in a week to several weeks, the patient is thought to have sarcoidosis. Recently however Tromer has with justification cast doubt on the validity of this conclusion.

The essential diagnosis is made clinically and histopathologically by exclusion of the skin lesions, lymph nodes or bone lesions. Sarcoidosis should be differentiated from Hodgkin's disease, lymphosarcoma, leukemia cutis, leukemia, erythema induratum mycosis fungoides, fungous infection, tuberculosis, nodular lupus erythematosus, leprosy and syphilis.

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tions, arsenotherapy and roentgen ray therapy.

Roentgen therapy is considered best. A series of six weekly treatments of roentgen rays (unfiltered) may be administered. If the lesions remain, filtered roentgen therapy should then be tried. Roentgen treatment, of course, should be carried out only by a skilled dermatologist or radiologist.

Application of dry ice should be made directly to the lesions for 10-40 seconds under moderate pressure. It may be repeated once or twice at weekly intervals.

Arsenic may be given in the form of Fowler's solution (Potassium Arsenite Solution N.F.) in drop doses diluted with water and administered three times daily to a total of 2 or 3 drops three times daily, then continued for one or two weeks. Instead, minim (0.06 cc.) of sodium arsenate, 1 per cent sterile solution, may be given intramuscularly every second day for one or two weeks.

Bismuth subsalicylate in oil in doses of 0.25-0.5 cc. given intramuscularly once weekly for six injections has been employed in older children; lesions disappeared promptly.

I have obtained good results in children with vitamin D (Calciferol, U.S.P.) in doses of 0.6 cc. (10 drops) to 1.2 cc. (20 drops), the latter dose for older children, given twice daily for several weeks. One drop of Calciferol U.S.P. contains 250 U.S.P. units. Nausea, vomiting, headache and renal damage may occur from overdosage. Serum calcium levels should be determined and urinalysis carried out routinely when calciferol is administered over a prolonged period.

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more rings results in crescentic or polycyclic figures. Discrete solid papules may be seen within the circinate lesions or outside but in close proximity to the larger ringed lesion.

DISSEMINATED (GENERALIZED) FORM.—In this type the lesions discrete and firm invade the corium to a considerable depth. Their color is that of normal skin. In size they vary from pinhead to a large pea. Generally they are found on the extensor surfaces of the extremities. They may occur along with the ringed lesions. There are no subjective symptoms.

Erythema elevatum diutinum is believed to be a variant of granuloma annulare. Its lesions are usually flat but may be slightly elevated.

Diagnosis.—Diagnosis is simple being based on the clinical picture already described.

Differential Diagnosis.—Lichen planus annulares and tinea circinata may need to be ruled out however because of their circinate lesions. *Lichen planus annularis* can be ruled out by failure to find the typical polygonal papule. In addition lichen planus is pruritic whereas granuloma annulare is asymptomatic. However biopsy is sometimes necessary in difficult cases.

Tinea circinata can be ruled out if careful inspection of the peripheral border shows nodules but no vesicles. Furthermore, under the Wood light no fluorescent hairs will be seen and culture of scrapings of the skin of the lesion will reveal no mycelial threads and fungi.

Complications and Prognosis.—There are no known complications. The condition may persist for months or years. Spontaneous involution is not infrequent. Interestingly when the edge of the lesion is excised, as for biopsy the condition frequently clears up. Spontaneous involution often follows also after surgical excision of a single lesion. Recurrences are common.

Treatment.—There is no known method of prevention. As far as is known the condition is neither infectious nor contagious.

The several standard methods of treatment include applications of dry ice, bismuth mi-

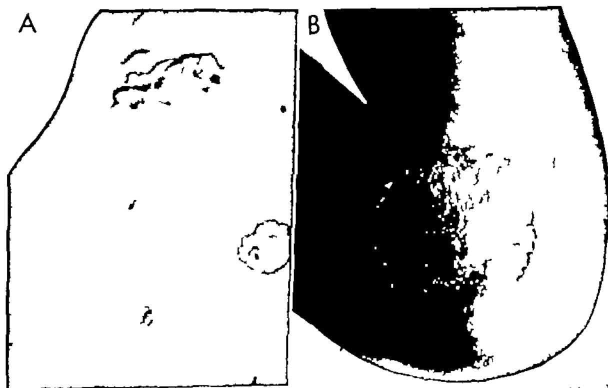


Fig. 80.—A, granuloma annulare on the hand of a child. (Courtesy of Dr. Meyer L. Niedelman.) B, granuloma annulare in a female infant 20 months of age. The single circinate lesion about the size of a half dollar is on the lateral aspect of the left forearm. The eczematized clinical picture is due to the topical application of 7 per cent tincture of iodine, which the mother had applied on the advice of a neighbor believing this to be ringworm of the skin. The condition involuted spontaneously after several weeks. (Courtesy of the Department of Dermatology, The Flower and Fifth Avenue Hospitals, New York.)

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Infections by Viruses, Rickettsia and Bacteria

VIRUSES IN GENERAL, are smaller than bacteria and will pass through a Berkefeld filter They require living cells in order to grow and multiply and most of them demonstrate a predilection for certain tissue. Thus the virus responsible for herpes zoster is said to be "neurotropic" because it attacks the nerves from posterior ganglia similarly the viruses responsible for molluscum contagiosum and the common wart in which the skin is primarily the seat of infection, are said to be dermatropic or more specifically epidermotropic. Many of the recent advances in identification of viruses have been made with the electron microscope The viruses are grown for such studies on the chorio-allantoic membrane of the chick embryo

The rickettsias are known to be either gram negative coccoid or bacillary organisms and are responsible for a considerable number of infections in children including Rocky Mountain spotted fever discussed in this chapter The clinical pathologic picture that they cause is not only due to destructive tissue changes but is also the result of toxic antigenic products.

Three diseases resulting from bacterial infection also are discussed in this chapter They are anthrax, caused by Bacillus anthracis erysipeloid caused by Erysipelothrix rhusiopathiae, and tularemia, caused by Pasteurella tularensis. Antibiotics have been used effectively in the treatment of all three of these diseases.

Herpes Simplex
(Fever Blisters, Cold Sores)

Herpes simplex is an acute infectious disease caused by a filtrable virus and characterized by an acute eruption consisting of grouped vesicles on an erythematous base. Aphthous stomatitis, also caused by the herpes virus, is discussed in Chapter 30

Etiology.—Herpes simplex is not contagious and is therefore seldom transferred from one person to another It may occur at any age. Recurrent attacks are the rule once the virus has invaded and attached itself to the living cells of the body It is assumed that the virus, latent in the cells, becomes activated from time to time by a "trigger mechanism," which may operate through many causes. For example the trigger may be touched off by overexposure to the sun or by trauma such as a tooth extraction or a hypodermic injection Focal infections such as abscessed teeth sinusitis, grippe the common cold, gastro-intestinal disturbances and such infections as pneumonia and cerebrospinal meningitis are other responsible factors. Emotional disturbances have been known to produce an attack. Several epidemics of herpes simplex among school children, accompanied by constitutional disturbances have been reported.

The vesicular fluid contains the virus, which when inoculated into the scarified cornea of the rabbit, is followed by keratitis. The latter is

a test of diagnostic importance and usefulness.

Clinical Picture.—The typical lesion (Fig. 81) is preceded by several hours by a sensation of tightness or burning of the skin at the site of the eruption. Sometimes a burning feeling is complained of by older children. A slightly hyperemic, edematous spot appears, soon followed by a cluster of discrete, round smooth, pinhead to larger size, closely packed vesicles. Generally there are not more than two or three vesicles, although there may be as many as a dozen. The vesicular content, clear at first and rarely hemorrhagic, soon becomes seropurulent, and many f the vesicles may become confluent.

Sites of predilection are the lip, face, around the mouth, alae nasae, ear lobes and external genitalia. The trunk and extremities are less frequently involved. In moderate and severe cases the regional lymph nodes become enlarged, tender and even painful. In a few days the vesicles rupture; they become dry and a yellow to brownish crust is formed which falls off in another few days, leaving a slightly reddish area as healing ensues. Scar tissue seldom occurs. Exceptionally a mild febrile reaction occurs.

Herpes simplex is characterized by recurrence. Among children, *herpes recidivans* occurs periodically and at almost the same season each year The mucous membranes of the mouth may be involved when herpes lesions appear on the lips or face and also independently of skin lesions. The tongue may also be involved

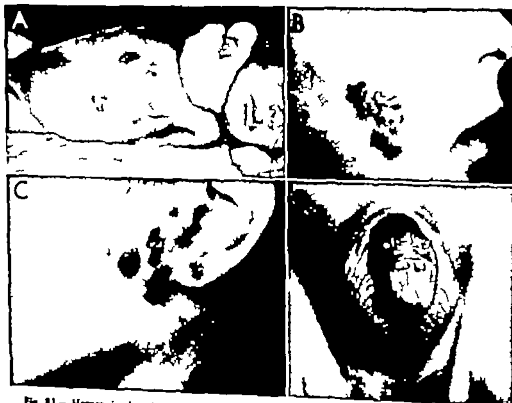


Fig. 81.—Herpes simplex. A, neonatal herpes simplex in a premature infant 11 days of age. Note the clusters of vesicles on the trunk. In B, note the cluster of vesicles on an inflammatory base. C, impetiginized herpes simplex. D herpes progenitalis in boy in an unusual site for child Note the vesicular lesions on the glans penis. The herpes simplex lesions are similar to those found on the face but are frequently complicated by secondary infection. (A by permission from Epstein, H. C and Crouch, W L. Pediatrics 13 553-555 June 1954 B courtesy of Dr C. S. Wright and Dr R. Friedman. C courtesy of Dr C. S. Wright and Dr J P Gucquerre.)

Herpes simplex of the oral mucous membrane is of short duration.

Diagnosis.—Diagnosis is comparatively simple. A group of small vesicles appear quite suddenly on the skin preceded by stinging or burning at the site. At first discrete and clear the lesions later become seropurulent opaque and confluent rupture occurs and is followed by crust formation. Frequently a history of exposure to the sun or a common cold is elicited.

Differential Diagnosis.—Herpes zoster vesicular eczema, impetigo contagiosa and dermatitis venenata should be differentiated. Unilateral herpes simplex may make differentiation from *herpes zoster* difficult sometimes necessitating resort to the corneal rabbit test. The pain that precedes herpes zoster in older children and adults is not diagnostically helpful in children in whom this symptom is absent. However the asymmetrical distribution of the herpes zoster lesions is characteristic. Furthermore, one attack of herpes zoster leads to permanent immunity whereas recurrence is the rule in herpes simplex.

Vesicular eczema as a rule is easily ruled out by the lack of a family history of atopy and of an exudative dermatosis that is better or worse from time to time. Furthermore, pruritus in herpes simplex is only slight. *Impetigo contagiosa* of the lips is sometimes confused with the crust of herpes simplex. However in impetigo contagiosa there is a single vesicle or bulla instead of many minute vesicles and the lesions are not localized to a small area of the skin but soon spread to adjacent areas. In addition the lesions of herpes simplex show a greater tendency to become impetiginized.

In *dermatitis venenata* a history of exposure to poison ivy sumac or oak may be elicited. The characteristic linear vesicular lesions are accompanied by severe edema and erythema.

Complications and Prognosis.—Herpetic meningoencephalitis follows in rare instances. Secondary infection (i.e. pyoderma of the lesions) is not uncommon among children. Herpes simplex is one of the few virus diseases that do not lead to lasting immunity.

Prognosis is good although recurrences are the rule. The ailment lasts from a week to 10 days.

Treatment.—An attempt should be made to prevent conditions such as grippe or the common cold that may precipitate or be accompanied by an attack of herpes simplex. The virus of herpes simplex is found in the saliva and conjunctival sac, and unsuccessful attempts have been made to immunize patients with it. Individuals who have herpes simplex after exposure to the sun should use sun screens and take other precautions against overexposure. Other factors that serve as trigger mechanisms should be studied and eliminated as far as possible.

Recurrent herpes may lead to scarring and lymphedema. Repeated vaccination with smallpox vaccine once every two weeks for a total of 4 to 8 vaccinations sometimes prevents recurrences even though a "take" does not occur after such procedure since both the smallpox and the herpes simplex virus are biologically closely related.

Many remedies have been tried for the local treatment of herpes simplex. Sponging the lesions with hot water has proved helpful at times. So also has the local use of 95 per cent alcohol or spirit of camphor. Another method is to rupture the vesicle and then to apply flexible collodion. Use of astringent lotions such as Dalibour water or aluminum acetate solution, and touching the lesions with dry ice lightly so as not to produce a scar have given varying degrees of success.

For very extensive lesions characterized by edema, continuous wet dressings of aluminum acetate solution, 1 part to 20 or 30 parts of water are serviceable. The wet dressing should be followed by a soothing paste consisting of aluminum acetate solution 10 parts, anhydrous lanolin 20 parts, and simple Lassar's paste 30 parts. Generally it is best to keep the lesions as dry as possible and to avoid the use of ointments, which tend to macerate the skin. Autohemotherapy using 5 cc. of whole blood taken from the vein in the arm and given intramuscularly into the buttocks, is at times very useful. A reliable multiple vitamin preparation should be administered by mouth. For herpes simplex involving the mucous membranes of the mouth, an infusion of coffee because of its tannic acid content, has proved useful for relief of pain of the excoriated lesions.

See Formulary ℞ 19 antiphlogistic and astringent; 79 antiphlogistic and to localize infection 90, for abortive therapy

Herpes Zoster
(Shingles, Zona, Zoster)

Herpes zoster is a nervous symptom complex, characterized by grouped vesicles surrounded by an inflammatory base and usually situated unilaterally Two main types are recognized, symptomatic and idiopathic. Other types are generalized herpes zoster and herpes zoster gangrenosum, both rare in children. Generalized herpes zoster is of varicelliform nature. Hemorrhagic herpes zoster is uncommon, as also is the bullous variety

Etiology.—Herpes zoster is essentially an inflammation of the sensory nerve roots and their posterior ganglia. The skin innervated by the intercostal nerves is frequently affected, but the facial and ophthalmic nerves and, occasionally branches of the sciatic nerve, also may be involved. The principal question is whether the skin eruption is secondary to the neuritis or caused by the virus itself. Goldsmith of England believes the virus is responsible for both the neuritis and the skin lesions. In any case there seems to be close relationship between herpes zoster and varicella, for the viruses are related biologically and clinical evidence supports this view In children who have never had varicella but have been exposed to herpes zoster varicella has been known to follow approximately two weeks after exposure. On the other hand, some children have herpes zoster and varicella at the same time. Furthermore, one attack of herpes zoster is seldom followed by a second attack. In other words, the virus of herpes zoster behaves clinically very much like that of varicella, particularly in working out a permanent immunity

As with herpes simplex, precipitating causes include drugs, particularly those of the heavy metals, arsenic, bismuth, lead, mercury and gold and also the iodides, morphine and thiamine chloride all of which may act as trigger mechanisms The blood dyscrasias, particularly leukemia, may cause herpes zoster Syphilis, tabes, paresis, encephalitis, tuberculosis, diabetes and syringomyelia may be responsible in adults but some of these are rarely met with in children. Trauma, such as a fall or a blow on the chest received in football scrimmage, may be a precipitating factor Herpes zoster occasionally follows vaccination with the smallpox virus. Finally tumors of the spinal cord may be responsible. Both sexes are affected and the disorder may occur at any age.

Clinical Picture.—The grouped vesicular lesions usually are unilateral although bilateral herpes zoster is occasionally seen in children in which case the lesions may be symmetrical or asymmetrical. The sharp, shooting neuralgic pain which precedes the eruption in the adult is not present in children, nor is the burning sensation frequently complained of by adults. Older children may complain of itching or a sensation of tightness at the site of the affection. The area involved is at first erythematous or slightly edematous. Suddenly after a few hours or at most a day a group of small vesicles appears, usually one or two, seldom more than a dozen. The vesicles are tense pearly and smooth and vary from pinhead to small pea in size. They are discrete but closely packed although later they may become confluent (Fig. 82) Usually on the third day the vesicles become opaque and somewhat flatter and in another two days they begin to dry The cycle is completed in 8 to 12 days. As a rule the vesicles do not rupture spontaneously Crusts appear which are finally cast off by the 1_th to 20th day The lesions are distributed along the course of a peripheral nerve, in children usually the intercostal nerve. Several days after the original eruption, another area of the skin may undergo similar changes so that it is not uncommon to find several plaques of herpes zoster with clear intervening skin between them. This cycle may continue over two or three weeks. Residual pigmentation, which is occasionally seen, may persist for years. The regional lymph nodes are enlarged. Paresthesias, trophic and joint disturbances and motor paralysis are rare in children. Ophthalmic zoster a severe form of herpes zoster that may be followed by blindness, is rare in children. Hunt's syndrome, otic herpes zoster involves the otic ganglion. Characterized by pain in the ear dizziness and a

bloody discharge, it is occasionally seen by the dermatologist in adults, but most often by the otologist. It too is rare in children

Diagnosis.—Grouped vesicles situated unilaterally on erythematous skin following the course of a peripheral nerve and appearing quite suddenly are usually herpes zoster Generally there is a mild febrile reaction. The chest is the most common site in children There may be no pain

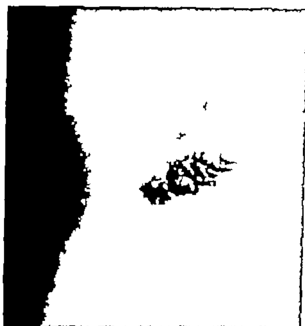


Fig 82.—Herpes zoster in a girl 11 years of age Note the cluster of vesicopustules on the posterior chest wall and surrounded by an inflammatory base The vesicopustules have become confluent and follow the segment of skin innervated by an intercostal nerve Another small patch of several discrete younger vesicles may be seen above the older patch. The onset of the eruption was preceded by pain, which is unusual in younger children There was also some postherpetic neuralgia

The most common disorder to be differentiated from herpes zoster is herpes simplex. Vesicular eczema also may mislead the uninitiated *Herpes simplex* is characterized by grouped vesicles with a bilateral distribution, whereas herpes zoster lesions follow the course of a peripheral nerve in unilateral distribution. An attack of herpes simplex is usually followed by other attacks, whereas an attack of herpes zoster generally establishes lifelong immunity The lesions of herpes simplex are followed by regeneration of the epithelium those of herpes zoster by scar formation. In difficult instances it may be necessary to resort to the corneal rabbit test which is positive in herpes simplex, negative in herpes zoster The lesions of herpes simplex are apt to occur upon the mucocutaneous junction, while those of herpes zoster occur generally upon the chest.

Prognosis.—The course is self-limiting and ends without sequelae in a few weeks.

Treatment.—Prophylaxis consists of a search for causes and an effort to correct them wherever possible.

A simple dusting powder or paste applied to the lesions is generally all that is required. Greasy ointments are best avoided because they macerate the skin facilitate rupture of the vesicles and invite secondary infection. A simple dusting powder such as the following may be ordered to advantage

℞

Menthol (0.15%)	0 03
Zinc stearate	10 0
Starch	10.0
Purified talc	10 0

Misce et fiat pulveris
Signa. Dust upon lesions p.r.n.
Indications Antipruritic, antiphlogistic

In older children rebellious to other treatment 5 to 10 cc. of a 20 per cent sterile solution of sodium iodide (equivalent to 1 to 2 Gm) may be used intravenously This dose may be repeated every second or fourth day Occasionally good results have followed the intravenous injection of thiamin chloride in daily doses of 50 to 100 mg. It may also be administered by mouth Sympathomimetic drugs such as neostigmine methyl sulfate in dose of 0.5 to 1.0 cc of a 1 2000 solution given daily intramuscularly is valuable for relief of pain in the older child For recalcitrant cases unfiltered x-ray applied directly to the lesions and over the spinal ganglia may be helpful. This treatment, of course, should be administered by a trained roentgenologist or dermatologist. Aspirin is useful in relieving pain in older children and for mild constitutional symptoms. The dose is 1 gr (0 065 Gm.) for each year of the child's age, with a maximum of 5 gr (0.37 Gm) given every four hours.

See Formulary ℞ 19 *for antiphlogistic*

and astringent; 90, to prevent secondary infection.

Kaposi's Varicelliform Eruption

(Disseminated Cutaneous Herpes Simplex)

Kaposi' varicelliform eruption is a clinical syndrome caused by a virus infection superimposed on a chronic dermatitis (usually atopic eczema) and attended by constitutional symptoms.

Etiology.—Evidence based on animal inoculation and observation of antibodies and nuclear inclusions points to the herpes virus as the cause. The patient's skin has previously been damaged by a dermatosis, usually topic dermatitis. In a few reported instances the eruption has followed recent attacks of scarlet fever or erythema multiforme in infants and children.

Clinical Picture.—The signs and symptoms vary from mild disturbances with comparatively few herpetic lesions to severe toxic states, in which the entire skin is covered and which may eventuate in death. Usually onset is sudden, with high fever which may last three to four weeks and terminate by lysis. The lesions (Fig. 83) consist of vesicles and varioliform, umbilicated pustulopapules varying from small pea-size to bullae and situated on highly erythematous base. The vesicles closely simulate the lesions of chickenpox, smallpox and vaccinia.

The lesions are most abundant in areas commonly involved by atopic dermatitis, although adjacent, apparently noneczematous areas also may show lesions. The skin of the face is particularly affected, the abdomen and back occasionally with less pr fuse spread to the neck, arms, fingers and lower extremities. The closely packed lesions on the face often become confluent. After 48 to 72 hours, a fresh crop f vesicopustules appears. The older lesions now show some desiccation or rupture, followed by crust formation. As the crusts fall off, the corium is exposed. Hyperpigmentation may follow The cicatrices left in the wake of the acute disturbances are flat and depigmented. New crops of vesicles may continue to appear for 7 to 10 days.

A characteristic feature is the facial edema, which, at the height of the infection, may be sufficiently severe to close the eyes. At the height of the cutaneous disturbances the eczema rash f des and may even disappear entirely as is generally observed in atopic dermatitis during any febrile disturbance.

Fever is usually moderate, 100–10 F although in severe cases it may rise to 104 F



Fig. 83.—Kaposi' varicelliform eruption in subsiding stage in an infant with atopic dermatitis who was exposed to person with herpes simplex. (Courtesy of The Children Hospital, Philadelphia.)

Diagnosis.—The type of eruption described above, occurring suddenly with a febrile reaction and constitutional symptoms, is diagnosed as Kaposi's varicelliform eruption. There may be a history of atopic dermatitis or some other dermatosis.

The increase in serum antibody during the disease is valuable confirmatory evidence. Animal inoculations, including keratitis in the rabbit after corneal inoculation and subsequent neutralization tests, aid in identifying the herpes virus.

Blank has shown by the cytologic smear technic of Tzanck that the characteristic "virus type" giant cells prepared from the base of the

bloody discharge, it is occasionally seen by the dermatologist in adults but most often by the otologist. It too is rare in children.

Diagnosis.—Grouped vesicles situated unilaterally on erythematous skin following the course of a peripheral nerve and appearing quite suddenly are usually herpes zoster Generally there is a mild febrile reaction. The chest is the most common site in children. There may be no pain.

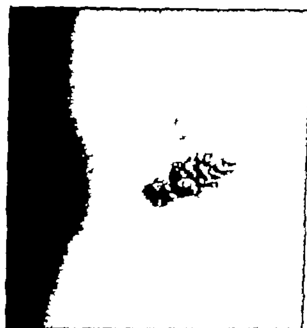


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The most common disorder to be differentiated from herpes zoster is herpes simplex. Vesicular eczema also may mislead the uninitiated *Herpes simplex* is characterized by grouped vesicles with a bilateral distribution, whereas herpes zoster lesions follow the course of a peripheral nerve in unilateral distribution. An attack of herpes simplex is usually followed by other attacks, whereas an attack of herpes zoster generally establishes lifelong immunity The lesions of herpes simplex are followed by regeneration of the epithelium those of herpes zoster by *scar formation*. In difficult instances it may be necessary to resort to the corneal rabbit test which is positive in herpes simplex, negative in herpes zoster The lesions of herpes simplex are apt to occur upon the mucocutaneous junction, while those of herpes zoster occur generally upon the chest.

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Starch	10.0
Purified talc	10 0

Misce et fiat pulverus
Signa Dust upon lesions p.r.n.
Indications Antipruritic, antiphlogistic

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See Formulary ℞ 19 for antiphlogistic

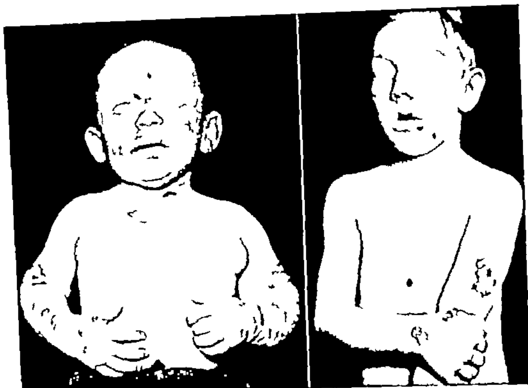


Fig. 84 (left).—Eczema vaccinatum in an infant 15 months of age. The child was being treated for atopic dermatitis. Meantime he as vaccinated and ten day afterwards the aricelliform eruption appeared. Note the umbilicated varicelliform lesions which mark the sites of the previous lesions of atopic dermatitis. The child made an uneventful recovery but with scarring.
Fig. 85 (right).—Generalized vaccinia. (Courtesy of Dr C S Wright and Dr R Friedman.)

is a history either of vaccination of the patient or of his exposure to some other vaccinated person in his immediate surroundings. In most cases the disease is self-limited, with the lesions healing normally as neutralizing antibodies develop. A smaller number of cases have been reported in which lesions continue to develop over period of weeks or months and quit a number of them have resulted in fatalities.

Clinical Picture.—The incubation period varies from a few days to three weeks. The first sign is the appearance of a vesicle or a number of discrete vesicles anywhere on the skin. Soon afterward and with abrupt suddenness, crops of vesicles (Fig. 84) follow the first lesion and continue to appear for the next 48 hours. Strangely enough, most of the lesions appear at the site f the eczematous eruption On the other hand, some vesicles may appear on normal skin distant from heavily affected areas. But no area of the skin is exempt for the esicles have been found to occur on the scalp eyelids, tongue, genitalia and even the nasal septum. On close examination, single vesicle will be found multiloculated, the fluid content, very clear at first, later may become purulent as secondary infection occurs. At a somewhat later development the central portion becomes umbilicated and necrotic. In less severe cases, the lesions begin to involute by the end of a week form crusts after another week (Fig. 85) which in turn fall off, leaving pitted scars.

The rash is preceded by headache, malaise, drowsiness and fever which may reach 104 F but is of short duration. The patient looks quite ill. Regional denopathy is lmost always found,

vesicles can be demonstrated by Giemsa stain. Such cells, seen only in herpes simplex, herpes zoster and varicella, offer a rapid diagnostic aid.

Ec ema vaccinatum can be differentiated by use of the following table.

Complications.—Complications include temporary loss of hair purulent otitis media, diarrhea pharyngitis and conjunctivitis. *Abscess of* the regional lymph nodes may follow Convul-

	ECZEMA VACCINATUM	K.V.E
Recent smallpox vaccination or contact with recent vaccination	Yes	No
Recent herpes simplex or contact	No	Yes
Age	Children	Adults and children
Type of lesion	Papules, umbilicated pustules	Herpetic grouped vesicles
Paul's test	Negative	Positive
Herpetic inclusion bodies in rabbit cornea	No	Yes
Guarnieri and Paschen bodies in rabbit cornea	Yes	No
Immune bodies. Precipitation test specific for virus of herpes simplex	No	Yes
Virus of vaccinia	Yes	No

sions and encephalitic changes have been noted at autopsy

Prophylaxis and Treatment—*Prompt* isolation is important. Hospitalized infants should be confined in cubicles and every precaution should be taken to guard against cross infection Every effort should be made to keep infants and children with atopic dermatitis or other dermatoses from contact with persons having herpes simplex or recent vaccination. The elbows should be splinted and the fingernails cut short to prevent scratching.

Chlortetracycline (Aureomycin) and penicillin are the remedies of choice. Chlortetracycline should be given in dosage of 10-20 mg./lb per day *orally in four divided doses.* Penicillin should be given intramuscularly daily for the secondary infection. For infants, the average daily dose of procaine penicillin is 300 000 units daily or 50 000 units given every three hours around the clock until the patient remains afebrile for 48 hours. For acute edema of the face and other parts of the body continuous wet dressings of either potassium permanganate (1 20 000) or an infusion of chamomile flowers are recommended. The latter is very useful for edema of the eyelids. Starch baths and starch poultices are valuable for removing crusts.

See Formulary ℞ 3 to use as wet dressing for secondary infection 86, for removal of crusts

From Riley K. A., and Callaway J L. J Invest. Dermat. 9 321 December 1947

Eczema Vaccinatum

(Generalized Vaccinia)

This is an acute febrile disease *usually occurring* in infants and children under 5 years of age with a history or clinical evidence of atopic dermatitis. It is characterized by a generalized vesicular eruption which appears within a few days to three weeks after exposure to vaccinated individuals. According to Ross generalized vaccinia occurs once in 20 000 to 40 000 vaccinations and in about two thirds of cases the condition develops in persons with skin diseases. Fries *et al* report that during the 1947 mass vaccination campaign in New York City the incidence of eczema vaccinatum was approximately one per 150 000 vaccinations.

Although in reported cases of eczema vaccinatum the patients have not shown any obvious dermatoses, almost all have either eczema *or some other itching dermatosis.* Usually there

both eyes show redness and are swollen and indurated. One or several ulcerations may be seen along the margins of the lids. The ulcer may be covered with a white membrane.

Diagnosis.—A history of vaccination of a member of the family or contact with a playmate who has been recently vaccinated will help considerably in establishing the diagnosis. This fact together with a history of a number of unsuccessful vaccinations provides almost conclusive evidence that the lesion is accidental vaccinia. As confirmatory evidence, after the suspected lesion has healed, an immune reaction to subsequent vaccination would tend to confirm the diagnosis. Laboratory diagnosis includes the use of that test which tends to confirm the presence of vaccinia virus, i.e., the growth of the vaccinia virus on the chorio-allantoic membrane of an embryonated egg. A Paul test (keratoconjunctivitis in rabbit) also is useful, as is histologic examination of the cornea for disclosing the characteristic basophilic cytoplasmic inclusion (Guarnieri) bodies in the epithelial cells. A marked rise in the neutralizing antibody titer in the patient's serum during convalescence is also corroborative evidence in favor of vaccinia virus. Vaccinia should be considered in the differential diagnosis of any localized, slowly developing, vesicopustular lesion. Primary syphilis, tuberculosis, pyogenic infection and herpes simplex should be considered in the differential diagnosis.

Complications and Prognosis.—In ocular vaccination, involvement of the cornea is the most serious complication because impaired vision may follow. In approximately one third of the reported cases of vaccinia with ocular complications, the cornea has been involved. The lesion heals by a scar. The prognosis is good as a rule. However, the possibility of impaired vision in ocular vaccinia should be remembered.

Treatment.—Children with accidental vaccination should be isolated and parents should be warned to have such a patient sleep alone. Treatment consists in the use of antibiotics and sulfonamides and, for ocular vacciola, in the use of irrigations and hot compresses. Aureomycin may be used locally and orally with good results, in doses of 250 mg. every eight hours by mouth for a total of 120 hours. Aureomycin, 5.0 mg. per 1.0 cc. of borate solution, may be prescribed to flush the eye and eyelids every four hours while the patient is awake and potassium permanganate 1:100,000 solution (made fresh daily) may be applied as wet compresses four times daily for five days. Irrigations of boric acid at hourly intervals during the day and hot



Fig. 86.—Vaccinia acquired from sleeping with recently vaccinated sister. Typical vaccination scars resulted. (Courtesy of Dr. Thomas Butterworth.)

compresses of boric acid solution for 20 minutes, three times daily, are serviceable.

The following is a useful prescription for ocular vaccinia.

℞
Terra-Cortril Suspension 5 cc.
Sig.: Instill one drop into the affected eye every hour for the first eight doses, then every two hours for the following day, then every three hours the third day, gradually reducing the intervals until the eye has improved completely.

Lymphogranuloma Venereum

(Lymphogranuloma Inguinale, Lymphopathia Venereum)

Lymphogranuloma venereum is a widespread disease caused by a filtrable virus and usually transmitted by venereal contact.

Etiology.—Lymphogranuloma venereum is

the individual nodes becoming enlarged, tender and painful In younger children hepatosplenomegaly is often encountered.

Diagnosis.—The patient usually has eczema or some other itching dermatosis. A history will disclose contact with some recently inoculated person and that the first vesicles appeared a few days to three weeks after that time. Positive proof can be obtained with the Paul test. Inoculation of the lesions contents into the cornea of a rabbit produces a keratitis. Guarnieri bodies can be demonstrated in the lesions or in the tissues of the inoculated rabbit. Neutralizing antibodies against vaccinia may be demonstrated during convalescence.

Differential Diagnosis.—Eczema vaccinatum should be differentiated from variola and Kaposi's varicelliform eruption A history of exposure to *variola* or to an epidemic of smallpox, the absence of a good vaccination scar or failure to have been vaccinated or revaccinated over many years tell in favor of variola. The characteristic papular eruption on the fourth day of illness which gradually becomes vesicular then pustular together with severe constitutional symptoms, should lead one to suspicion of smallpox. However an absolute differentiation of eczema vaccinatum from mild variola is extremely difficult. The differential diagnosis of Kaposi's varicelliform eruption is tabulated on page 236

Prognosis.—The mortality rate has been reported to be as high as 33 per cent Most deaths are caused by general sepsis and encephalitis. Keiden *et al* reported a fatal case of generalized vaccinia in a baby Secondary lesions developed two weeks after vaccination and fresh lesions continued to appear until death occurred five weeks later No neutralizing antibodies for vaccinia could be demonstrated in the serum and the electrophoretic analysis showed complete absence of gamma globulin. Scarring does not often occur the residuals of the rash gradually fade after several months.

Prophylaxis and Treatment.—Only under extreme circumstances should vaccination be performed in a person suffering from a skin affliction acute or chronic or from an acute debilitating disease It has been recommended also that vaccination in infants and children be avoided if atopic dermatitis or other skin disease exists in other members of the family but that if it is essential to vaccinate, the child should be completely separated from those with the skin disease for at least 21 days. By the same token patients recently vaccinated should be excluded from pediatric wards containing patients with atopic eczema, other diseases of the skin, burns or healing surgical incisions. Vaccination of a pregnant woman should be permitted only in special circumstances such as a smallpox epidemic since there is evidence to show that during the first trimester it significantly increases fetal mortality

Specific therapy consists in the use of hyperimmune vaccinal gamma-globulin given intramuscularly in doses of 0 6 to 1 0 ml./kg. of body weight. This dose may be repeated daily if fresh lesions continue to appear in a severely ill patient.

Accidental Vaccination

While accidental vaccination is infrequent a number of cases have been reported in the literature. Almost any part of the body may be the site, including the nose, ears, lips, tongue, tonsils, eyelids and cornea, and the perianal and genital areas The modes of occurrence of ocular complications not rarely following vaccination include (1) autoinoculation in which there is direct transfer of the virus from the site of the vaccination to the eye and (2) heteroinoculation in which the virus is transformed from one person to another These modes apply also to other sites. The area affected appears swollen and is painful An indurated oval ulcer soon follows, usually with a raised border and a crusted depressed center (Fig 86) The regional lymph nodes soon become enlarged and are tender Usually there is no fever nor are there constitutional symptoms as a rule. In anal accidental vaccination the lesion involves the same sequelae as the customary smallpox vaccination except that the crusting is soft and moist. Furthermore there is severe anal pain on defecation walking and sitting.

In ocular vaccination the lids, conjunctiva and cornea may be involved. The lids of one or

May be obtained from Dr C. Henry Kempe, Professor and Head, Department of Pediatrics, University of Colorado Medical Center 4200 East Ninth Avenue Denver 20, Colorado

both eyes show redness and are swollen and indurated. One or several ulcerations may be seen along the margins of the lids. The ulcer may be covered with white membrane

Diagnosis.—A history of vaccination of a member of the family or contact with a play mate who has been recently vaccinated will help considerably in establishing the diagnosis. This fact together with a history of a number of unsuccessful vaccinations provides almost conclusive evidence that the lesion is accidental vaccinia. As confirmatory evidence, after the suspected lesion has healed, an immune reaction to subsequent vaccination would tend to confirm the diagnosis. Laboratory diagnosis includes the use of that test which tends to confirm the presence of vaccinia virus i.e., the growth of the vaccinia virus on the chorio-allantoic membrane of an embryonated egg. A Paul test (keratoconjunctivitis in rabbit) also is useful, as is histologic examination of the cornea for disclosing the characteristic basophilic cytoplasmic inclusion (Guarnieri) bodies in the epithelial cells. A marked rise in the neutralizing antibody titer in the patient serum during convalescence is also corroborative evidence in favor of vaccinia virus. Vaccinia should be considered in the differential diagnosis of any localized, slowly developing, vesicopustular lesion. Primary syphilis, tuberculosis, pyogenic infection and herpes simplex should be considered in the differential diagnosis.

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Treatment.—Children with accidental vaccination should be isolated and parents should be warned to have such patient sleep alone. Treatment consists in the use of antibiotics and sulfonamides and, for ocular vaccinia, in the use of irrigations and hot compresses. Aureomycin may be used locally and orally with good results, in doses of 250 mg. every eight hours by mouth for total of 120 hours. Aureomycin, 5.0 mg. per 1.0 cc. of borate solution, may be prescribed to flush the eye and eyelids every four hours while the patient is awake; and potassium permanganate 1 100,000 solution (made fresh daily) may be applied as wet compresses four times daily for five days. Irrigations of boric acid at hourly intervals during the day and hot

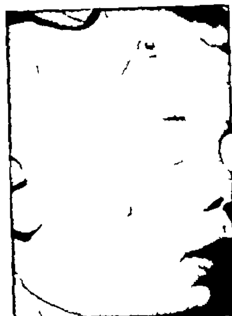


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Etiology.—Lymphogranuloma venereum is

generally considered a disease of adult life, although cases have been reported in children. The disease is caused by a specific filtrable agent which belongs to the psittacosis group The incubation period varies from a week to 12 days and occasionally up to 21 days. Banov states that of the reported cases of rectal manifestations of lymphogranuloma venereum in children in the world literature, 11 patients were girls and 2 were boys Eight patients had only rectal manifestations of the disease 5 had both inguinal adenitis and rectal lesions. Banov's patient, a 10-year-old Negro boy with rectal stricture, was the youngest. In the United States, the southern Negro is unusually susceptible to the infection Children may become infected through contaminated articles. Rectal infection in children has occurred by means of contaminated enemas, nozzles and less commonly by coitus perversus.



Fig. 87 —Lymphogranuloma venereum in a boy 15 years of age The Frei test was positive. Note the bubo at the right inguinal area. (Courtesy of Dr Meyer L. Niedelman)

Clinical Picture.—The clinical manifestations vary No one symptom is pathognomonic of the disease It is essentially systemic, with many and varying local manifestations including inguinal adenitis esthiomene (elephantiasis of the vulva) urethritis, conjunctivitis and the anorectal syndrome of proctitis and stricture formation Sites other than the genitorectal region are rarely affected in children. The childhood type of infection differs from the adult type in the frequency of isolated inguinal involvement as compared with rectal in adults. Furthermore, in children the primary infection is usually in the region of the urethra and most of the patients are girls.

The lesions may start on the genital organs or be extra-genital, on the mouth or tongue. The genital type is common in children. On the other hand, the first manifestation may be an anorectal stricture, all other clinical manifestations having been overlooked or absent. The clinical picture is confirmed by a positive Frei test and a positive complement fixation test.

In the genital type the disease is usually characterized by an erosion, a papule, a pustule or a transient herpetic vesicle or ulcer or urethritis, which may be the initial sign of the infection. However these are short lived and disappear in a few days without producing constitutional symptoms. An inguinal adenitis follows which is usually unilateral but may be bilateral. After a while, the enlarged tender glands become matted together into one large mass and the overlying skin becomes violaceous (Fig. 87) This development is followed by a breaking down of the mass with a discharge of pus from many sinuses. Healing is usually accompanied by scarring at the site of the bubo The disease may be accompanied by headache, loss of appetite loss of weight pains in the joints, malaise and weakness. The temperature is usually elevated and anemia and hyperproteinemia are not uncommon during the acute stage The disease tends to become chronic. On the other hand the signs and symptoms may be referred to the anorectal region. The frequency of the anorectal syndrome in the female is dependent on the fact that lymphatic drainage occurs from the initial lesion (vulva) into the lymph nodes in the lower part of the rectum In the male, drainage from the genitalia involves the superficial inguinal glands.

Pain in the stomach may occur with straining when there is a bowel movement. Rectal bleeding is not infrequent and the stools may appear smaller narrowed and thin. These symptoms may come on gradually and become progressive Upon rectal examination a hard, annu-

lar stricture is usually found several centimeters above the anus. Allergic manifestations in the form of erythema nodosum or multiple joint pains (arthritis) are not uncommon.

Diagnosis.—Diagnosis is suggested by the clinical picture and a history of possible sexual contact, the former to be confirmed by the Frei test* the complement fixation reaction or both. Chancroid, granuloma inguinale, inguinal adenopathy syphilis and ulcerative colitis should be considered in the differential diagnosis.

Complications and Prognosis.—The disease may cause conjunctivitis, ophthalmitis, cystitis, liver abscesses, migratory polyarthritis and skin rashes. Cases of meningo-encephalitis have been reported. Perianal sinuses occur in the anorectal type of infection and ulcerative colitis and proctitis are frequent in the rectal type.

The prognosis is good with the use of the newer antibiotics. Strictures may be avoided by their use.

Treatment.—For prophylaxis, reasonable care should be taken to avoid the use of common washcloths and enema tips when a member of the family is already infected.

The newer antibiotics, including Aureomycin, chloramphenicol and Terramycin, are the remedies of choice. Best results have been obtained by giving a dose of 250 mg. of these remedies, three to four times daily making a total daily dose of from 750 mg. to 1 Gm. for 14 to 21 days. Aureomycin is regarded by many dermatologists as the drug of choice. The recommended dosages are 250 mg orally three or four times daily for period of from two to six weeks.

Digital dilatations for the strictures are best carried out at weekly intervals and should be continued for several months.

Cat-Scratch Disease

(Cat-bite Fever Foshay-Debré Disease)

Cat-scratch disease is a self-limited disease with mild constitutional symptoms involving group of lymph nodes, the group involved depending upon the site of the inoculation. It is frequently but not invariably caused by the scratch of cat.

Etiology.—The most usual cause is the scratch of a cat although some cases have been reported in which a cat has played no part. However it would still seem that the offending organisms are present in the claws of house cats and are inoculated into the skin of human beings by scratching.

Although the etiology has not been clarified completely there is evidence to support the view that the infectious agent belongs to the psittacosis-lymphogranuloma group of viruses. Cassady and Culbertson suggest that even rubbing the eyes after handling a cat with an infected conjunctiva may serve to transmit Parinaud's oculoglandular syndrome. A cat's sneezing into the face was sufficient to transmit the disease in one reported case. Males and females are equally affected. Daniels and MacMurray reviewing a series of 160 cases, found that over one third of the patients were children under 10 years of age and two thirds were under three years of age. The incubation period varies from one week to a month.

Clinical Picture.—Usually the first sign noted is an enlarged lymph gland, which is sometimes of considerable size, tender but not painful and, because of its large size, stands out prominently The location of the enlarged gland will depend on the area scratched. The axillary glands are most frequently involved because the hands are the most frequent site of injury But the epitrochlear glands, the cervical, submandibular and even the gland in the parotid region may be affected.

A clinical picture of malaise, low grade fever and unexplained local adenopathy should arouse suspicion of cat-scratch fever In questioning the mother frequently but by no means always, history will be obtained of the child's having been associated with cats and in some instances of a cat scratch.

The inoculation site shows a small ulcer which may develop within two to four days. On

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*The Frei test consists of the intradermal injection of 0.1 ml. each of the virus antigen and controlled antigen in the flexor surface of the forearm. A papule of 7 mm. or greater in diameter at the end of 48 to 72 hours signifies either present or past infection with the agent of lymphogranuloma venereum. According to Grace the test is 95 to 100 per cent accurate. The test becomes positive in from 7 to 40 days after the appearance of the inguinal adenitis. In early cases, if the result is negative the test should be repeated.

the other hand the small ulcer may become manifest only at the time of development of lymphadenopathy Furthermore, the ulcer may remain latent during the course of the infection so that only by examination of the traumatized area will the presence of a healed papule or pustule be found Again the site of inoculation may be erythematous and swollen or in the process of healing. Frequently nothing more can be seen than a small papule resembling a mosquito bite. Usually within two to four weeks following inoculation the regional adenopathy begins In the limbs it is unilateral but on the head or neck it tends to be bilateral. As has already been stated, the glands may attain considerable size and may be associated with moderate fever and malaise Interesting is the fact that while the regional lymph nodes are enlarged there is no lymphangitis The skin overlying the glands may be reddened although most often it is normal There may be moderate leukocycosis with a tendency to a left shift in the differential count. Fever may be moderately high and may last only a few days, or it may be of the septic type. Again some children may be afebrile during the entire course of the infection

Diagnosis.—An unexplained regional lymphadenitis should arouse suspicion of cat-scratch disease. The following are the chief characteristics of cat scratch fever (1) A history of a scratch by a house cat or a history of contact with cats (not an absolute criterion) (2) a quiescent (or incubation) period of about one week or less (3) appearance of a red papule at the site of the scratch with an irregular fever lasting four or five days (4) appearance about one day later than the fever of swelling and tenderness of the regional lymph glands and occasionally a general enlargement of the lymph nodes and suppuration of the nodes in the region of the scratch (5) high white blood cell count with some early shift to the left of the granulocytes (6) negative results from agglutination and skin tests for tularemia and brucellosis (7) recession of the glands to normal in from three weeks to two months (8) a positive result from intradermal cat scratch skin test with specific antigen.

Differential diagnosis should include the following In any area, a simple pyogenic adenitis; in the neck tuberculous adenitis with scrofuloderma in the inguinal region lymphogranuloma venereum Tularemia, brucellosis, sporotrichosis and infectious mononucleosis may cause confusion

The most important single test for cat-scratch disease, as mentioned earlier is the intradermal test with a specific antigen.

Complications and Prognosis.—Some of the chief complications noted are persistence of the nodes, cough and transitory pulmonary infiltration and transient encephalitis.

Prognosis is uniformly good. The disease is self limited with complete recovery achieved in from several weeks to several months.

Treatment—Although there is no specific therapy most investigators have good results in shortening the duration of the disease and causing the glands to regress by antibiotic therapy especially by the use of oxytetracycline, chlortetracycline and chloramphenicol Amelioration of the systemic symptoms has been reported after administration of Aureomycin in doses of 25 mg. per kg. of body weight for 24 hours for a period of 10 days.

Surgical drainage or removal of the gland may be indicated when the enlarged gland suppurates. Sinus formation may follow and last as long as six months or more.

Verrucae

(Warts)

Warts are benign papillary growths, protuberant or flat and characterized histologically by hyperkeratotic proliferation of the skin. Six main types can be discriminated (1) verruca vulgaris (common wart) (2) verruca planae juvenilis (juvenile flat wart) (3) verruca digitata (digitate wart) (4) verruca filiformis (filiform wart) (5) verruca plantaris (plantar wart)

This test consists of the injection of 0.1 cc. of the antigen and observation I the site at intervals of 48 and 72 hours afterward A positive reaction consists in an indurated, raised, erythematous wheal, 5-10 mm in diameter surrounded by zone of erythema 30-40 mm in diameter The reaction may disappear in one t two days, but as rule the wheal can be recognized read ly four or five days later I a negative response there is no sociated erythema induration or swelling of the I jected tissue.

and (6) verruca acuminatum (acuminate wart) In addition there is the mosaic wart, the term mosaic describing the appearance of warts occurring in a particular pattern on the soles of the feet.

Etiology.—Warts are due to a filtrable virus and are both infectious and auto-inoculable. Several members of a family are sometimes affected. Although warts may occur at any age, children and young people appear to be particularly susceptible to the common and flat types. The incubation period varies from one to eight months. There undoubtedly exists an individual susceptibility otherwise it would be difficult to explain why one individual has but single wart and another has dozens. Epidemics of plantar warts have been reported among school children exposed to the same environment (e.g., bathroom floors) yet not all the exposed children acquire the condition.

Clinical Picture.—COMMON WART.—The common wart (Fig. 88) as its name suggests, is the type most often encountered. The warts occur chiefly on the fingers and hands but some times on the face and eyelids, especially at puberty They may be single or multiple and they sometimes occur in groups. Upon the fingers and dorsum of the hand, the lesion is a sharply rounded or projecting and circumscribed elevation, varying from pinhead to small pea size and gray grayish-black or yellowish in color The surface consists of small, hard, villous roughened edges, the base may be constricted so that the wart as a whole resembles a stalked pedicle. The common wart, it is to be noted, is neither sensitive nor painful except when located around or under the fingernails (verruca peri-unguium) when it may be sensitive and indeed very painful.

JUVENILE FLAT WART.—In contrast to the common type, the juvenile flat wart (Fig. 89) is only slightly elevated. It too is sharply circumscribed, round or polygonal, of normal skin color or perhaps slightly yellowish-gray or brown. The surface is hard. These warts, from millet-seed to pea size, show a predilection for the cheeks but are also found on the forehead, chin and temporal areas and on the hands. They occur in comparatively small numbers, al-



Fig. 88.—Multiple warts. Common warts (verrucae vulgares) of the hands and filiform warts of the chin, lips and right upper eyelid. (Courtesy of Dr C. S. Wright and Dr R. Friedman.)

the other hand, the small ulcer may become manifest only at the time of development of lymphadenopathy Furthermore, the ulcer may remain latent during the course of the infection so that only by examination of the traumatized area will the presence of a healed papule or pustule be found Again the site of inoculation may be erythematous and swollen or in the process of healing Frequently nothing more can be seen than a small papule resembling a mosquito bite. Usually within two to four weeks following inoculation the regional adenopathy begins In the limbs it is unilateral but on the head or neck it tends to be bilateral. As has already been stated the glands may attain considerable size and may be associated with moderate fever and malaise. Interesting is the fact that while the regional lymph nodes are enlarged there is no lymphangitis The skin overlying the glands may be reddened, although most often it is normal There may be moderate leukocycosis with a tendency to a left shift in the differential count. Fever may be moderately high and may last only a few days or it may be of the septic type. Again some children may be afebrile during the entire course of the infection

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Fig. 91 (top).—Filiform wart in a schoolboy. The threadlike wart responded after several applications of 5 per cent salicylic acid in collodion.

Fig. 92 (bottom).—Plantar wart of 6 months' duration in a boy 12 years of age.

though there may be dozens, often grouped and not infrequently associated with the common wart. Linear formations, particularly following scratch marks or an abrasion of the skin, are not uncommon. Children and young women are particularly susceptible. There are no subjective symptoms.

DIGITATE WART.—The digitate wart (Fig. 90) is a fingerlike projection whose horny surface protrudes from a narrow base. It may appear as a cluster of filiform warts. These, commonly seen on the scalp, neck and bearded region, bleed easily when traumatized.

FILIFORM WART.—The filiform wart (Figs. 88 and 91) occurs as a single slender threadlike projection on the neck, eyelids or nostrils and usually in middle-aged persons.

PLANTAR WART.—The plantar wart (Fig. 92)

Fig 89 —Juvenile flat warts (verrucae planae juveniles) A, on the hand wrist and forearm. B is a boy 16 years of age (*A* courtesy of Dr John Bellisario Photography by Mr Woodward Smith Department of Artistry University of Sydney *B* courtesy of Dr Herbert M Leavitt)



Fig 90.—Digitate wart (verruca digitata) Note the cauliflower pattern. (Courtesy of Dr John C. Bellisario. Photography by Mr Woodward Smith, Department of Artistry University of Sydney)

pigmentation and also of a history of the lesions having begun in early infancy or childhood. If the lesions are unchanged upon diascopic pressure, the warty nodules of *angiokeratoma* can be ruled out, since the latter lesions would become pale. The lesions of angiokeratoma are warty nodules with telangiectasia and dilated capillaries.

The lesions of the juvenile flat wart can be distinguished from those of *multiple benign cystic epithelioma* by their color and their sites of predilection. *Lichen planus* can be ruled out by the nonviolaceous appearance of the lesions, the sites of predilection and the absence of itching. Lentigines (ephelides) are flat and not elevated, in contrast to the slight elevation of the juvenile flat wart, and are more prominent in summer than in winter. *Epidermodysplasia verruciformis* begins in infancy or early childhood, is familial and very chronic and is frequently followed by carcinoma in later years. The lesions of *acrokeratosis verruciformis* are found upon the hands and feet, the plantar and palmar surfaces, and represent a familial condition.

PLANTAR WART.—To differentiate callosities and corns from plantar warts, the area may be pared and moistened with alcohol, mineral oil or glycerin. The central portion then is seen to better advantage and, in plantar warts, tiny dark points can be seen which, in fact, are blood coagulated in the tips of the enlarged papillae. Pain is elicited more easily by lateral than by direct pressure. In callosities, there is no break in the normal capillary lines. The hard corn is characterized by its central horny core, which is hard to direct pressure. It contains no vascular elements.

Prognosis.—Warts are benign growths and are not followed by malignant degeneration. Most disappear after the topical application of keratolytics or after oral and intramuscular therapy. Frequently they disappear spontaneously but recurrences are common and local and systemic management is at times highly frustrating.

Treatment.—The aim in treatment is to destroy the wart, to prevent recurrence and to prevent spread to the same person or to others. As a prophylactic measure, at least paper sandals should be worn when walking barefoot, especially in bathhouses or at the seashore.

TREATMENT OF COMMON WARTS.—*Topical methods* include the local use of escharotics, among them glacial acetic acid, monochlor dichlor and trichloracetic acid. They should be used cautiously and only after each wart has been surrounded by a piece of blotting paper or cardboard, the center of which is punched out to make a tight window through which the wart protrudes. The wart is then touched lightly with a wooden applicator that is properly shaved and dipped into the acid. The excess acid should be carefully wiped off before the applicator end only is applied to the wart. This procedure may be repeated daily or on alternate days until the wart falls away.

Among *parenteral methods* autohemotherapy has been successful at times, as has also the intramuscular injection of sterile milk or solan, several times weekly. Bismuth subsalicylate in oil, administered by intramuscular injection in doses of 0.25-0.5 cc. for six injections at weekly intervals, has sometimes proved satisfactory in my own experience.

Freezing with dry ice for periods varying from 30 seconds for a small wart to 3 or 4 minutes for larger ones has been used successfully. The lunar caustic stick also has been used with apparently good results.

Galvanocautery is one of the most popular and reliable methods for treating warts of the filiform and small pedunculated and digitate types. By its use one can gauge the exact amount of tissue to be destroyed. Following cauterization, a pair of fine pointed scissors may be used to excise the part, after which operation the area is curetted.

Surgical treatment consists in complete excision of the wart. Its disadvantage is that keloid or painful scar may follow and recurrence is possible if not all the active wart cells are removed.

Roentgen-ray therapy should be used only by the skilled operator. Verruca vulgaris, digitate and filiform warts are not radiosensitive and therefore seldom respond to irradiation. For verruca vulgaris it is customary to employ 1 or 2 skin units of roentgen ray. For the *plantar* wart the dose is 1,000 r with the surrounding healthy skin carefully shielded with lead foil.

may be considered a common wart which because of its location on the sole of the foot and because of pressure on the foot in walking, grows inward instead of outward It is tender and painful when pressure is exerted on it from the side. It is frequently mistaken for a corn or callosity Of various sizes but usually about the size of a pea, it is covered with hyperkeratotic material which when pared away shows numerous small black specks. The plantar wart




Fig 93 (left).—Acuminate wart of 6 months duration in a boy 14 years of age. (Courtesy of Dr Meyer L. Niedelman.)

Fig. 94 (right).—Mosaic warts on the heel. Note the grouping of lesions and the soggy appearance due to maceration. (Courtesy of Dr John C. Belisario Photography by Mr Woodward Smith Department of Artistry University of Sydney)

may be single or multiple it usually occurs at between 10 and 40 years of age. It is frequently found in persons with flattened arches. School children particularly are susceptible.

ACUMINATE WART—The acuminate wart (Fig. 93) is fungating pink in color and found particularly on the external genitalia, thighs and anus. It is cauliflower shaped lobulated or pedunculated and tends to ulcerate and discharge a *fetid seropus*. It occurs in older persons of both sexes.

MOSAIC WART—The term "mosaic wart applies to a particular pattern of warts which appear in large patches on the soles of the feet (Fig. 94) The mosaic appearance is the result of the fusing of warts that are close to each other. *Such lesions are dry and usually painless.*

Diagnosis and Differential Diagnosis.—COMMON WART AND JUVENILE FLAT WART—The common wart and the juvenile flat wart are easily diagnosed Nevertheless, blackheads and acne papules are sometimes mistaken for them. Close examination of the lesions with a hand lens will show that both types of warts have a roughened surface unlike the smooth surface of the acne papule. The two types of warts can be differentiated by the fact that the juvenile flat wart, with its flattened or only slightly elevated protuberance, never attains the size of the common wart.

The rough and solid surface of the common wart is a characteristic that *differentiates* it from *molluscum contagiosum* in which the lesions are usually multiple with a smooth, wax like surface and a central dimple through which a cheeselike substance may be expressed. In *tuberculosis verrucosa cutis* the border of the lesion is bluish-red and the verrucous elements are more numerous. *Nevus verrucosa* can be ruled out by the absence of vascularization and

Misce et fiat
Signa: Apply daily
Indication: Verruca vulgaris

℞ 6

Trichloracetic acid	1 part
Salicylic acid	6 parts
Glycerin q. s. ad to make paste	

Misce et fiat pasta

Signa: Apply paste after paring the wart and surrounding with adhesive plaster. The paste is allowed to remain on the wart for periods varying from 1 to 3 days. Repeat procedure for 4 to 6 weeks or until cured

Indication: Plantar wart

(Upton Paste modified according to J. Belmaro)

℞ 7

Podophyllin (10-20%)	3.0-6.0
Compound tincture benzoin vel	
Acetone vel	
Ether q.s.	30.0

Misce et fiat

Signa: Apply accurately to each wart after the surrounding skin has been covered with zinc ointment or paste. Remove in 6 to 10 hours and apply mild antiseptic ointment, night and morning. A second or third application may be applied after the previous reaction has subsided

Indication: Acuminate warts

(J. Belmaro)

℞ 8

Formaldehyde solution (5%)	1000.0

Signa: Apply as soak daily or twice daily followed by

Salicylic acid (25-40%)	15.0-24.0
Petrolatum q. ad	60.0

Misce et fiat unguentum.

Signa: Apply three times weekly

Indication: Plantar wart

(R. F. A. Beck)

℞ 9

Salicylic acid plaster (Duke)	40%

Signa: Apply accurately portion for one week, curette away the macerated skin. Repeat weekly for several weeks. Follow by 50-100% aqueous solution of silver nitrate which is swabbed over the area and repeated every four or five days. Curettage as required

Indication: All kinds of warts

(R. F. A. Beck)

Molluscum Contagiosum

Molluscum contagiosum is a mildly contagious, autoinoculable disease characterized by waxy papules of varying sizes with umbilicated centers.

Although seen in adults, molluscum contagiosum is much more common in children. Occasionally it occurs in epidemic form in institutions. It may be contracted in public bath houses through use of turkish towels, or by direct contact with other infected children. The contents of the lesions are contagious. The disease is thought to be caused by a virus, since the inoculable material can be passed through a Berkefeld filter. It has never been cultured. See also Figure 95.

Clinical Picture.—The lesions (Fig. 96) consist of minute, elevated papules, acuminate, of pinhead to large pea size, or slightly flattened, oval, slightly reddish, yellowish or whitish. Early the lesions are "seed-like" and after several weeks they attain a typical globoid waxy appearance. In this phase the lesions are firm, semitranslucent and marked by a central depression or umbilication (Fig. 96 *B*) through which a cheese-like curd may be expressed. The umbilication is seen clearly if the lesion is sprayed with ethyl chloride. The lesions are discrete and at times closely packed. The cheese like substance expressed from the lesion consists of "mollusk bodies," that is, degenerated hyalinized and dystrophic epithelial cells. The papules may be few or many. I have seen several children with dozens of asymmetrically located papules on one side of the chest in a "zosteriform" arrangement. Any part of the body may be affected, but the face, upper eye lids, neck, external genitalia and trunk are most commonly involved. Lesions may even be found upon the scalp.

Molluscum contagiosum is probably disseminated through autoinoculation. The lesions may disappear spontaneously or upon irritation. At times secondary infection will cause them to involute completely. If untreated, molluscum contagiosum may persist for months. Itching may be mild or severe but is usually nonexistent.

Diagnosis.—In typical instances, the pea-sized, waxy semitranslucent globoid papules, depressed in the center through which a cheese-like curd may be extracted, readily establish the diagnosis. When the lesions are multiple and milia-like diagnosis may be more difficult.

Differential Diagnosis.—*Verruca vulgaris* may be confused with molluscum contagiosum especially when the lesions of the latter are small and numerous. However when fully developed, the surface of molluscum contagiosum is

The large percentage of recurrences of plantar warts following roentgen therapy has lessened the popularity of this method.

Psychotherapy was the treatment of choice of Bruno Bloch, who used verbal suggestion combined with painting of the warts with eosin, injection of physiologic saline solution or administration of a placebo dose of roentgen rays or some other form of irradiation. Such procedures resulted in disappearance of 44 per cent of common warts and 88 4 per cent of juvenile flat warts, it is reported, with all of them gone within the second month, most of them within the first month, and 60 per cent of juvenile warts responding to the first treatment.

TREATMENT OF JUVENILE FLAT WARTS.—The best treatment for juvenile flat warts is the topical application of Vleminckx s solution. Add 1 tablespoonful to a pint of hot water and apply to the warts as a wet dressing for 20 minutes nightly for one to two weeks Or superficial desiccation may be used, especially for juvenile warts on the face.

TREATMENT OF PLANTAR WARTS.—The plantar wart is an example of a seemingly simple dermatosis which gives the dermatologist considerable concern for there is no agreement as to the best treatment. As already mentioned, roentgen ray therapy is followed by recurrence in a large percentage of patients. The method devised by Belisario has given me good results. *The wart is pared just to the point of bleeding* which is controlled by the application of monochloracetic acid and the wart is surrounded with adhesive tape or collodion The center is then filled with a drop or two of 50 per cent podophyllin in tincture of benzoin compound and the whole area is covered for 24 hours with adhesive tape. On removal of the tape, the area is dabbed with Zephiran concentrate in 1 10 dilution, night and morning The wart is pared every three or four days and the podophyllin paint is reapplied for 24 hours every 7 to 10 days. If the treatment proves effective, cure usually takes place in four to six weeks.

In still another method, first the wart is frozen by an ethyl chloride spray then it is curetted thoroughly and Monsel's (iron subsulfate) solution, which acts as a styptic is applied *to the treated area.*

I have also had good results from electrodesiccation preceded by paring of the hyperkeratotic tissue. Two per cent procaine is the anesthetic of choice.

Representative Prescriptions

In the prescriptions which follow ℞ 1 2, 3, 4 and 5 are recommended for the *common wart* ℞ 1 3 and 4 for *juvenile warts;* ℞ 6 and 8 for *plantar warts* ℞ 7 for *acuminate warts,* and ℞ 9 for *mosaic* and all other types.

℞ 1

Salicylic acid (3%)	0 9
Lactic acid (3%)	0 9
Flexible collodion q s. ad	30 0

Misce et fiat collodii
Signa. Apply to wart
Indications Verruca vulgaris and juvenile [illegible]

℞ 2

Salicylic acid (12%)	4 0
Lactic acid (12%)	4 8
Podophyllin (24%)	8 0
Resin	0 6
Ether	8 0
Collodion	30 0

Misce et fiat collodii
Signa. Apply as a paint once or twice daily to the wart. (Pare wart weekly or oftener until almost gone, aided by a currette, carbon dioxide and acetone slush)
Indication. Verruca vulgaris (J Belisario)

℞ 3

Salicylic acid	4 0
Lanolin	
Soft paraffin aa	15 0

Misce et fiat unguentum
Signa. Apply
Indication. Juvenile flat warts and verruca vulgaris (J Belisario)

℞ 4

Resorcin	
Ammoniated mercury aa (5%)	1 5
Zinc oxide	4.0
Vaseline q s. ad	30 0

Misce et fiat unguentum
Signa Apply several times daily
Indication Juvenile flat warts and verruca vulgaris (J Belisario)

℞ 5

Salicylic acid	1 part
Glacial acetic acid	9 parts

Zephiran concentrate is an aqueous solution containing 12.8% of Zephiran chloride. It is official as Benzalkonium Chloride U.S.P

Soft paraffin is equivalent to Petrolatum U.S.P

Misce et fiat
Signa: Apply daily
Indication: Verruca vulgaris

℞ 6

Trichloracetic acid	1 part
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Glycerin q.s. ad to make paste	

Misce et fiat pasta
Signa: Apply paste after paring the wart and surrounding with adhesive plaster. The paste is allowed to remain on the wart for periods varying from 1 to 5 days. Repeat procedure for 4 to 6 weeks or until cured
Indication: Plantar wart
(Upton Paste modified according to J. Belisario)

℞ 7

Podophyllin (10-20%)	3.0-6.0
Compound tincture benzoin vel	
Acetone vel	
Ether q.	30.0

Misce et fiat
Signa: Apply accurately to each wart after the surrounding skin has been covered with zinc ointment or paste. Remove in 6 to 10 hours and apply mild antiseptic ointment night and morning. A second or third application may be applied after the previous reaction has subsided
Indication: Acuminate warts
(J. Belisario)

℞ 8

Formaldehyde solution (5%)	1000.0

Signa: Apply as soak daily or twice daily followed by

Salicylic acid (25-40%)	15.0-40
Petrolatum q. ad	60.0

Misce et fiat unguentum
Signa: Apply three times weekly
Indication: Plantar wart
(R. F. A. Beck)

℞ 9

Salicylic acid plaster (Duke)	40%

Signa: Apply suitable portion for one week, curette away the macerated skin. Repeat weekly for several weeks. Follow by 50-100% aqueous solution of silver nitrate which is swabbed over the area and repeated every four or five days. Curettage as required
Indication: All kinds of warts
(R. F. A. Beck)

Molluscum Contagiosum

Molluscum contagiosum is a mildly contagious, autoinoculable disease characterized by waxy papules of varying sizes with umbilicated centers.

Although seen in adults, molluscum contagiosum is much more common in children. Occasionally it occurs in epidemic form in institutions; it may be contracted in public bath houses through use of turkish towels, or by direct contact with other infected children. The contents of the lesions are contagious. The disease is thought to be caused by a virus, since the inoculable material can be passed through a Berkefeld filter. It has never been cultured. See also Figure 95.

Clinical Picture.—The lesions (Fig. 96) consist of minute, elevated papules, acuminate, of pinhead to large pea size, or slightly flattened, oval, slightly reddish, yellowish or whitish. Early the lesions are "seed-like" and after several weeks they attain a typical globoid waxy appearance. In this phase the lesions are firm, semitranslucent and marked by a central depression or umbilication (Fig. 96, *B*) through which a cheese-like curd may be expressed. The umbilication is seen clearly if the lesion is sprayed with ethyl chloride. The lesions are discrete and at times closely packed. The cheese-like substance expressed from the lesion consists of mollusk bodies, that is, degenerated hyalinized and dystrophic epithelial cells. The papules may be few or many. I have seen several children with dozens of asymmetrically located papules on one side of the chest in a "zosteriform" arrangement. Any part of the body may be affected, but the face, upper eyelids, neck, external genitalia and trunk are most commonly involved. Lesions may even be found upon the scalp.

Molluscum contagiosum is probably disseminated through autoinoculation. The lesions may disappear spontaneously or upon irritation. At times secondary infection will cause them to involute completely. If untreated, molluscum contagiosum may persist for months. Itching may be mild or severe but is usually nonexistent.

Diagnosis.—In typical instances, the pea-sized, waxy semitranslucent globoid papules, depressed in the center through which a cheese-like curd may be extracted, readily establish the diagnosis. When the lesions are multiple and milia-like, diagnosis may be more difficult.

Differential Diagnosis.—*Verruca vulgaris* may be confused with molluscum contagiosum, especially when the lesions of the latter are small and numerous. However when fully developed, the surface of molluscum contagiosum is



Fig 95.—Molluscum contagiosum. Histopathologic section of skin shows enlarged oval shaped molluscum bodies in the rete pegs (rete malpighii) which are greatly enlarged. Within the rete pegs the inclusion bodies stain eosinophilic but in the stratum corneum they stain basophilic.

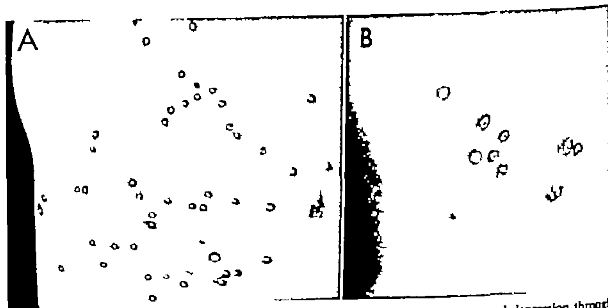


Fig 96.—Molluscum contagiosum in a boy In A, several lesions show the central depression through which a cheese-like substance may be expressed. (Courtesy of Dr Meyer L. Niedelman) In B the classical dimpling in the center of each papule can be seen more plainly (Courtesy of Dr Herbert M. Leavitt.)

smooth, not rough or hyperkeratotic as in the common wart. Further the wart has no central depression nor is it possible to squeeze from it a cheese-like substance. When molluscum lesions are smaller than usual, it may be necessary to use a hand lens to discover the central dimpling (*umbilication*) *Milia* occurs more frequently in the neonatal period and is characterized by minute, closely packed vesicles, the contents of which are clear Upon pricking of a milia vesicle with a sterile needle, a clear fluid is obtained. *Fibromas*, seldom seen in children, are usually solid, single and hard. They present no central umbilication and *it is impossible to* express any cheese-like substance.

Complications and Prognosis.—Molluscum contagiosum sometimes undergoes suppuration. If untreated, molluscum contagiosum may last for months. Recurrence is possible.

Prophylaxis and Treatment.—Prophylaxis consists in avoiding contact with children who have the disease. Infected children should be kept out of school until all lesions have been completely destroyed or have disappeared. Mediate articles, such as towels, bathing suits, etc., should be disinfected by boiling. The common swimming pool and public bath house should be avoided.

The best treatment is to open the individual lesions with sterile Hagedorn needle, carefully express the contents, then apply 7 per cent tincture of iodine or paint the base of the lesion with lunar caustic (silver nitrate) A single treatment generally cures. I prefer these to trichloracetic acid and other escharotics. In apprehensive children, the lesions may be anesthetized by ethyl chloride spray before treatment is begun When the lesions are small and numerous, hot pplications of Vleminckx's lotion (Sulfurated Lime Solution N F) will effect a cure. Aureomycin administered orally and applied topically is ineffective.

See Formulary ℞ 6, as keratolytic for numerous smaller lesions 80 as keratolytic for single larger lesions.

Rocky Mountain Fever

(Rocky Mountain Spotted Fever Sheep Camp Fever)

Rocky Mountain fever is an acute infectious disease accompanied by mild or constitutional symptoms and characterized by a *maculopapular* rash, the latter often becoming petechial or purpuric.

Although the disease is commonly found in the Rocky Mountains, cases have been reported in all states with the probable exception of those of New England. The disease is endemic in Canada, Brazil, Colombia and Mexico. Both sexes may be affected. The cause is Rickettsia rickettsii. The vector is either the dog tick or the wood tick, and the reservoir is probably wild rodent. The incubation period varies from 2 to 12 days, with an average of 6 to 7 days.

Clinical Picture.—The clinical picture closely simulates typhus. Often preceding the eruption a mottling of the skin may be seen accompanied by fever which is the forerunner of the exanthem. The latter usually appears from the second to the twelfth day of the illness, or about the third or fourth day after the onset of fever However the rash occasionally may be delayed until the sixth or seventh day At first the rash is either macular or maculopapular later it becomes transformed into a petechial rash of a dusky-red color and in some cases it even assumes the hemorrhagic form of a true purpura (*Fig. 97*) *Usually but not invariably the eruption* is first noticed on the wrists, ankles and back of the trunk. Thence it spreads gradually over the extremities and the remainder of the body The eruption appears in crops. The eruption may be sparse or profuse over the entire body marked on the extremities and less so on the face. The palms and soles may also become involved.

The rash is followed by desquamation and pigmentation. This stage usually marks the convalescent period. Desquamation may be especially noticeable on the hands, feet and face. Edema may occur The tongue is coated and constipation is usually present. Fever may be of the remittent or intermittent type and terminates by lysis. The blood shows a moderate anemia, the white blood cells may be increased between 15,000 and 30,000 per cu. mm. with a relative increase in the mononuclears, but also a leukopenia may occur The Wassermann test and Widal reaction are occasionally positive

Diagnosis.—When a definite history of tick bite is elicited or the patient resides in those



Fig 95.—Molluscum contagiosum. Histopathologic section of skin shows enlarged oval shaped molluscum bodies in the rete pegs (rete malpighii) which are greatly enlarged. Within the rete pegs the inclusion bodies stain eosinophilic but in the stratum corneum they stain basophilic.

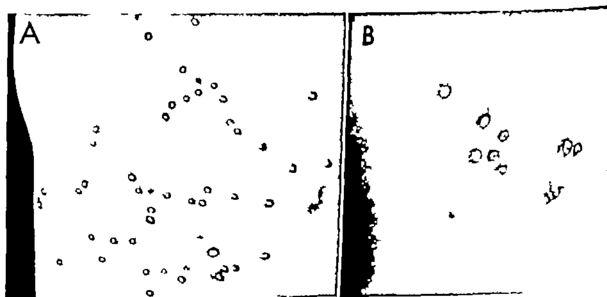


Fig 96 —Molluscum contagiosum in a boy In A, several lesions show the central depression through which a cheese-like substance may be expressed (Courtesy of Dr Meyer L. Niedelman.) In B the classical dimpling in the center of each papule can be seen more plainly (Courtesy of Dr Herbert M Leavitt.)

of protection. Cox yolk sac vaccine is employed, three subcutaneous injections of 0.5 cc. each at 5 to 7 day intervals. The committee takes care to point out that occasionally severe reactions may occur especially in egg-sensitive individuals. Older children should be taught to remove ticks and younger children should be examined by the parents. Any ticks found should be removed but children should be cautioned not to remove the ticks from dogs.

With the use of the broad spectrum antibiotics, mortality from Rocky Mountain spotted fever has been practically eliminated and the clinical manifestations can be arrested in about two to three days. Terramycin should be employed in initial doses of 50 mg./kg. body weight for adults; children receive approximately two thirds of the adult dose. Therapy continues until the temperature reaches a normal level provided that defervescence is accompanied by apparent clinical improvement. The two antibiotics that command attention as specific remedies are chloramphenicol (Chloromycetin) chlortetracycline (Aureomycin) or oxytetracycline (Terramycin). The dosage recommended by the Committee on the Control of Infectious Diseases of the American Academy of Pediatrics (1957) is as follows Oral chloramphenicol (Chloromycetin) 20 mg./lb. daily up to 60 mg. lb. per day four times daily intramuscularly 30 to 60 mg./lb. daily Oral chlortetracycline (Aureomycin) 10 mg./lb. per day four times daily More recently tetracycline has come to be regarded as the drug of choice because of the few side effects and the absence of depressant action on the bone marrow

The antibiotics referred to above, being rickettsiostatic but not rickettsiocidal, act to reduce the toxemia and the temperature.

Electrolyte imbalance should be corrected. Nutrition should be maintained by an adequate soft and liquid diet during the illness. Gavage may be necessary when there is a loss of appetite. For hyperpyrexia an ice-cap may be applied and sponge baths, too, may be used to control the elevated temperature. Because the disease is essentially an obliterating endarteritis, every effort should be made to prevent bed sores in cases of prolonged illness.

Anthrax

Anthrax is an acute disease of cattle sheep hogs, goats and horses, transmissible to humans and caused by the Bacillus anthracis. Of the three main types, cutaneous, pulmonary and intestinal, only the cutaneous type will be described here.

The disease is rare in children The most



Fig. 98 — Classical anthrax lesion on the fourth day of illness in boy 10 years of age. Note the depressed, brownish black, ulcerated center of the lesion, surrounded by ring of vesicles. The vesicles were at first yellowish, then became reddish brown and finally turned black as they became part of the dried black eschar. A moderate degree of soft tissue edema surrounded the lesion and there is regional adenopathy along the line of drainage. The source of the infection was goat hair (Courtesy of Dr Herman Gold.)

common method of infection is by direct inoculation of the skin The incubation period varies from one to five days

The areas most commonly affected are the exposed parts of the body where the organism is probably introduced into the skin through an abrasion The initial lesion begins as an inflam-

areas where Rocky Mountain *spotted fever* is common these data are of diagnostic value. The onset of the disease occurs after an incubation period of 3 to 14 days. The rash appears from the second to sixth day *after the illness* The lesions, macular papular and petechial usually appear first on the extremities, but *they may* occur on the trunk Symptoms include moderate to severe headache, neurologic manifestations, generalized aching and pain in the back neck and extremities. The febrile period lasts two to three weeks the temperature falls by lysis by the end of the third week. A rising titer in neutralization complement fixation and Weil Felix reactions are diagnostic.

In children the disease should be differentiated from *typhus fever* when there is difficulty guinea-pig inoculation tests and biopsy of the skin lesions should be resorted to *Typhoid fever* can be ruled out by blood culture *measles* can be ruled out by the absence of Koplik spots and catarrhal symptoms and later in the disease by the petechial character of the rash *Meningococcemia* and *purpura hemorrhagica* also must be considered.

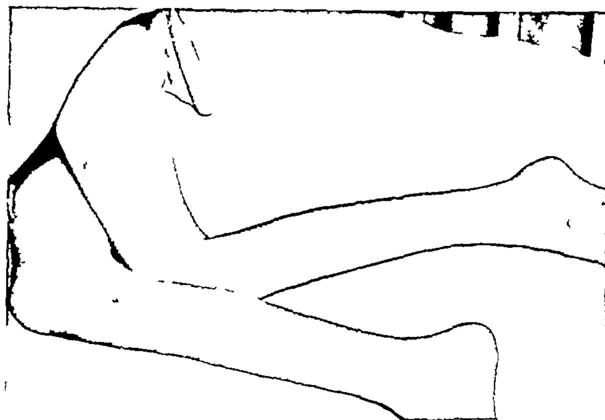


Fig. 97.—Rocky Mountain fever showing purpuric rash (Courtesy of The Communicable Disease Center United States Public Health Service Graham Reid, Chief Utilization Unit.)

Complications and Prognosis.—The complications most commonly encountered include bronchial, lobar or hypostatic pneumonia, phlebitis, hiccups and hemorrhages from the nose, intestines or kidneys. Gangrene of the skin of the fingers and toes and of the scrotum and penis has been reported.

Before the introduction of the antibiotics the mortality rate was high. Parker in the Bitter Root Valley section of western Montana found the death rate for children to be about 37.5 per cent in adults, about 80 per cent

Treatment—The Committee on the Control of Infectious Diseases of the American Academy of Pediatrics (1955) advises active immunization only for individuals particularly adults, working in highly endemic areas. Protection is not long-lasting. Stimulating doses must be given annually to maintain a high level

neat or rabbit skin. Biopsy is not considered a justifiable procedure, since any surgical intervention may cause systemic spread of the infection.

The condition should be differentiated from *pyogenic infection*. The latter can be ruled out by the absence of pain, suppuration and adenopathy

Complications and Prognosis.—Symptoms of arthritis may persist after the skin lesions have disappeared. *Erysipeloid* is a self-limited disease which runs an average course of approximately three weeks. Recurrences are not uncommon both in patients who receive penicillin and in those in whom spontaneous resolution occurs.

Treatment.—Inasmuch as erysipeloid of Rosenbach occurs more often in older people than in children, prophylaxis applies mostly to the adult, particularly those engaged in the fish and meat trades. However accidental infection has occurred in children.

Penicillin, administered intramuscularly is the drug of choice. However it must be given in adequate dosage and for a prolonged time to be effective, for recurrences have been known to appear after all signs of the disease had subsided. Penicillin has been effective in total doses varying from 100,000 to 1 000,000 units.

In the localized form, the hand should be carried in a sling or preferably in splint. Wet or dry heat should be applied several times a day Kiroder likes a wet dressing consisting of 1 per cent ichthammol in alcohol.

Representative Prescription

℞
Ichthammol (12%) 22.0
Diluted alcohol 180.0
Misce et fiat
Signa: Apply on gauze as wet dressing
Indication: Anti-inflammatory antiphlogistic

Tularemia

(Rabbit Fever)

Caused by bacterium Pasteurella tularensis, this infectious disease is usually acquired by the handling of infected rabbits or other rodents or from the bite of blood-sucking insects Children are universally susceptible to it. The disease is prevalent throughout most of the United States.

Of the five recognized clinical types, ulceroglandular oculoglandular glandular typhoidal and pharyngotonsillar the most common and the one showing skin manifestation is the ulceroglandular type described here.

This type of tularemia is characterized by the appearance of a small papule at the site of infection. This papule, usually painful, is followed by a nodular swelling, which undergoes ulceration and is followed by a regional adenopathy After another few weeks the ulcer healing completely leaves a scar Red linear streaks *simulating the clinical picture of sporotrichosis* may be seen coursing from the initial papule to the nodes involved. The enlarged regional lymph glands are somewhat tender and painful and they undergo suppuration. The extremities are the most common location for the primary lesion. The initial lesion may also appear on the external genitalia, neck or thoracic wall. Most cases follow the bite of a tick others occur from contact with animals such as rabbits and squirrels.

Diagnosis.—The diagnosis is comparatively simple. The information elicited from the history will usually indicate that the patient has had contact with a wild rabbit or has been bitten by a tick. In some cases the patient may indicate the ingestion of meats from rabbits or squirrels. Every case of adenitis or the appearance of sepsis should indicate a search for a local lesion If further evidence is necessary the agglutination reaction of Foshay will be found to be an important diagnostic tool. This test, however does not become useful until the eighth or tenth day of the disease. Before this time the intradermal test may be useful as it has been found to be positive in over 90 per cent of cases in the first week of the disease. Tularemia should be differentiated from sporotrichosis, pyogenic infection, Rocky Mountain spotted fever glanders, anthrax, typhus fever tuberculosis, brucellosis and syphilis.

Treatment.—The Committee on the Control of Infectious Diseases of the American Academy of Pediatrics (1955) recommends active immunization only for laboratory workers; i.e., those engaged in handling wild rabbits. Prophylaxis consists in avoidance of areas infested

matory erythematous macule which appears within a few hours to a day after infection. The macule then transforms into a papule, which in time is followed by a vesicle that ruptures and becomes hemorrhagic. This stage eventuates in a dark central necrotic (eschar) area, tough and leathery in appearance and surrounded by a partial or complete ring of vesicles and a further surrounding area characterized by erythema and edema (Fig. 98) There is associated lymphangitis. Interesting is the fact that the local lesion is relatively painless although the regional lymph nodes may be tender and in some instances may suppurate. Until recent years the disease was accompanied by high mortality but with antibiotics and sulfonamides the mortality rate, fortunately has proved to be considerably lower

Diagnosis.—Diagnosis is based on three salient points (1) a history of exposure to the infection through accidental injury to the skin and contact with animals or animal products, especially imported ones (2) the appearance of the lesion i e., a typical black necrotic center and a ring partial or complete, of pearly translucent vesicles, the whole sitting on a red base in a hillock of widespread edema (3) bacteriologic diagnosis of the skin lesions, including culture revealing the presence of Bacillus anthracis. Other aids in diagnosis are the absence of pain with an unusual degree of edema and the fact that constitutional symptoms and signs are minimal or absent Anthrax should be differentiated from carbuncles, septic wounds and chancre.

Treatment.—No active prophylaxis has yet been developed for this disease Prevention is dependent upon the control of infection in animals and the employment of general hygienic and sanitary measures. The antibiotics are the most useful form of treatment and have been used with excellent results for the cutaneous manifestations Chloramphenicol and sulfathiazole have also been used with good results For topical use a sterile dressing should be employed to protect the papules or vesicles Continuous wet dressings are indicated for the edema and Burow's solution in 1 20 dilution may be applied as a cold wet dressing when edema is severe.

Erysipeloid

(Erysipeloid of Rosenbach, Swine Erysipelas)

Erysipeloid is an acute or chronic infectious disease caused by the erysipelas bacillus. Klauder distinguishes three forms of the disease (1) a mild, localized cutaneous infection; (2) a diffuse or generalized cutaneous eruption with constitutional symptoms and (3) a septicemic form The first type is the most common. In addition there is an intestinal type.

The causal organism is the Erysipelothrix rhusiopathiae, a slender rod, nonmotile and nonsporing that is widely distributed in nature wherever nitrogenous compounds are found decomposing. It has been recovered from the slime of fish, from houseflies and from horseflesh. Cases have been reported that followed a prick with a fishbone the handling of rabbit skin and a dog bite. Most of the cases have occurred in cooks, kitchen workers, butchers or people handling fish and most frequently between the months of May and September The incubation period varies between one and seven days.

Clinical Picture—Following a trivial injury while handling meat, fish or other forms of food, the part infected (usually hand or finger) is affected with a smarting or superficial itching and a feeling of stiffness of the underlying joints. The latter symptom is a frequent complaint. Examination of the lesion discloses the presence of an erythematous patch which spreads peripherally from the site of inoculation The margin of the lesion is raised and hot but is not acutely tender The color characteristically varies from pink to deep purple. As the disease extends peripherally the central area of the redness fades. It is interesting that in the localized type there is rarely an accompanying lymphangitis or adenopathy in fact, adenopathy is extremely rare. Constitutional symptoms are either mild or entirely absent. In most cases there is no fever

Diagnosis.—The clinical picture, with the purplish red color of the patch and its raised well-defined margin, is distinctive. The central red area fades as the disease spreads peripherally Suggestive evidence consists in a positive history of a bone injury or the handling of fish,

meat or rabbit skin. Biopsy is not considered a justifiable procedure, since any surgical intervention may cause systemic spread of the infection.

The condition should be differentiated from *pyogenic infection*. The latter can be ruled out by the absence of pain, suppuration and adenopathy

Complications and Prognosis.—Symptoms of arthritis may persist after the skin lesions have disappeared. Erysipeloid is a self-limited disease which runs an average course of approximately three weeks. Recurrences are not uncommon both in patients who receive penicillin and in those in whom spontaneous resolution occurs.

Treatment.—Inasmuch as erysipeloid of Rosenbach occurs more often in older people than in children, prophylaxis applies mostly to the adult, particularly those engaged in the fish and meat trades. However accidental infection has occurred in children.

Penicillin, administered intramuscularly is the drug of choice. However it must be given in adequate dosage and for a prolonged time to be effective, for recurrences have been known to appear after all signs of the disease had subsided. *Penicillin has been effective in total doses* varying from 100,000 *to* 1,000,000 units.

In the localized *form, the hand should be* carried in a sling or preferably *in* a splint. Wet or dry heat should be applied several times a day Klauder likes a wet dressing consisting of 12 per cent ichthammol in alcohol.

Representative Prescription

℞
Ichthammol (12%) 22.0
Diluted alcohol 180.0
Misce et fiat
Signa Apply on gauze as wet dressing
Indication Anti-inflammatory keratoplastic

Tularemia

(Rabbit Fever)

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Diagnosis.—The diagnosis is comparatively simple. The information elicited from the history will usually indicate that the patient has *had* contact with a wild rabbit or has been bitten by a tick. I some cases the patient may indicate the ingestion of meats from rabbits or squirrels. Every case of adenitis or the appearance of sepsis should indicate a search for a local lesion. If further evidence is necessary the agglutination reaction of Foshay will be found to be an important diagnostic tool. This test, however does not become useful until the eighth or tenth day of the disease. Before this time the intradermal test may be useful as *it has been found to be positive in over 90 per* cent of cases in the first week of the disease. Tularemia should be differentiated from sporotrichosis, pyogenic infection, Rocky Mountain spotted fever glanders, anthrax, *typhus* fever tuberculosis, brucellosis and syphilis.

Treatment.—The Committee on the Control of Infectious Diseases of the American Academy of Pediatrics (1955) recommends active immunization only for laboratory workers, i.e., those engaged in handling wild rabbits. Prophylaxis consists in avoidance of areas infested

with ticks and of the skinning of rabbits and squirrels and the ingestion of underdone meats.

At present the only satisfactory therapy is the use of the antibiotics, either orally or intravenously Several of these have been tried but the most effective appears to be streptomycin, which may be administered in doses of 25 mg./lb of body weight in divided doses every six hours for a week. It may also be given intramuscularly in doses of 10 to 20 mg./lb of body weight once or twice daily Response to this therapy is usually prompt, with a drop in the temperature and an amelioration of symptoms occurring within 48 hours

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18

Congenital Syphilis and Rat-Bite Fever

WHILE IT IS a truism that the incidence of congenital syphilis has been reduced considerably it is nevertheless important that the clinical manifestations be recognized early and for that reason it is here discussed in detail. While rat-bite fever is caused by Spirillum minus or by Streptobacillus moniliformis, the symptomatology when it is caused by the latter is similar to that when it is caused by the former a spirochete. It is appropriate, therefore, that it be discussed in this chapter

Congenital Syphilis
(Prenatal Syphilis)

Congenital syphilis is that form of the disease in which the *Spirochaeta pallida* (Treponema pallidum) is transmitted from the mother to the fetus. Usually the spirochete does not gain entrance into the fetus before the fourth month of pregnancy and it may possibly not do so until near full term. Syphilis in children may be the result of infection acquired in utero or after birth. In the former instance, it is spoken of as prenatal or congenital syphilis, in the latter instance as acquired syphilis.

Before the introduction of penicillin, from 3 to 4 per cent of all children born in the United States were affected with congenital syphilis. A mortality rate as high as 10 to 20 per cent was reported and morbidity rate as high as 50 per cent. Routine serologic testing of all prospective mothers, the requirement by state laws of premarital serologic examination of the blood for syphilis and the early diagnosis and early treatment of infected individuals have resulted in a marked reduction of the incidence of this disease.

Third generation syphilis has been reported by several investigators. Recently Wright and Inoue reported a family with a syphilitic infection running from grandparents to mother to infant. The data presented fulfilled the rigid criteria necessary for the diagnosis of third generation syphilis. The patient was the second baby of congenitally syphilitic mother Besides many signs of congenital syphilis and a four plus reaction from both blood and spinal fluid serologic tests, positive x-ray changes showed in the long bones The infant made an uneventful recovery treated with 2,400,000 units of penicillin administered over a two-week period. Reports of congenital syphilis in one of a pair of twins have also appeared in the literature

Clinical Picture.—EARLY PERIOD.—The symptomatology and clinical manifestations of con-

*The terms "congenital" and "hereditary" are often used synonymously when applied to syphilis. Strictly speaking, an hereditary disease is not one caused by a micro-organism, but is one resulting from some inherent change in the germ plasm, such as epilepsy. Accordingly for accuracy the term "hereditary" should not be used in this connection. It is to be hoped also that nomenclature experts will standardize the term "prenatal" rather than "congenital" syphilis, since the former is more accurately descriptive.

genital syphilis differ in several respects from acquired syphilis In the first place there is no primary lesion (or chancre) in congenital syphilis through which the Treponema pallidum enters the bloodstream. Instead, infection is transmitted through the placenta into the circulating blood Accordingly *syphilis in the fetus* may be looked upon as a generalized infection one *in which the visceral organs and skeletal* system are involved from the very beginning.

In young congenitally syphilitic infants the distribution and grouping of the lesions are different from those seen in older children and in adults with acquired syphilis *In acquired syphilis the eruption is more or less generalized while in the congenitally syphilitic infant the* rash is localized as will be disclosed later

An infant in the early stages of congenital syphilis is infectious and many of the active le*sions seen on the skin and mucous membranes* abound in Spirochaeta pallida. However most of the signs in congenital syphilis appear not at the time of birth but as a rule two or three weeks after The most important signs within this period consist of the following

Snuffles (syphilitic rhinitis)—A nasal discharge *sometimes blood tinged often occurs* It is of diagnostic importance in congenital syphilis since it appears almost as often as the skin eruption itself (Fig. 99 *B*) It is characterized by a purulent or hemorrhagic discharge from one or both nostrils. Its continuation for more than two weeks in any newborn infant should arouse suspicion that congenital syphilis is the cause The inflammatory reaction of the *nasal mucosa may be followed by ulceration ex*tending to the nasal cartilages (gummatous destruction of the base of the nose) and leading to that deformity known as "saddle nose" (Fig. 99 *D*) a sign pathognomonic of late syphilis.

Skin manifestations—The skin manifesta*tions are similar to the eruption in the* acquired type of the disease and because of their frequency are the most important single clinical manifestation of congenital syphilis. However the rash is not an infallible sign since it may be mild or even absent. The syphilitic infant is seldom born with a rash. The eruption usually appears between the third and eighth weeks it is characteristic and upon it alone a diagnosis of *congenital syphilis may often be made.*

The eruption may be erythematous, macular *papular* (occasionally) maculopapular or squamous. The sites of predilection for the maculopapular syphilid are the buttocks, extremities, inner aspects of the thighs, the face, and the palms and soles. Another distinguishing feature of the rash is its localization, with grouping of the lesions particularly on the mucocutane*ous areas such as the mouth, nose, anal region,* buttocks and external genitalia. Annular lesions are common in congenital syphilis, less frequent in acquired syphilis. In moist and sodden areas, the circinate syphilid tends to become eczematized with resulting ulceration. Such lesions may be seen in the groins, buttocks and external genitalia. Several circinate lesions in close proximity may unite to form crescentic rings (Fig. 99 *C*) *The color of the eruption is* of considerable diagnostic importance, varying from a slightly yellowish to a deep brown or copper color Syphilids are not superficial lesions but are markedly infiltrated

The palms and soles are frequently found to be the sites for desquamating syphilids. Accordingly in a newborn infant *desquamating lesions* on these areas should lead one to suspect con*genital syphilis. Bullous lesions on palms* and soles are said to occur in approximately 10 per cent of cases.

Nail changes—Onychia and paronychia may be present during early infancy Onychia is characterized by an inflammatory condition of the matrix. The nail becomes opaque dry and atrophic, and is finally cast off *A few drops of* pus may be found alongside the nail, evidence *of secondary infection One or all of the nails* may be affected However the condition is usually limited to one nail and these lesions are apparently a rare manifestation.

Condylomata—Condylomata are rarely seen in early infancy They are found most commonly during the second year of life or early childhood *Condylomata after the fifth* year are generally due to acquired syphilis. They *occur at the junction of the mucous membrane* and the skin on the scrotum, sometimes in moist and macerated areas of the skin such as

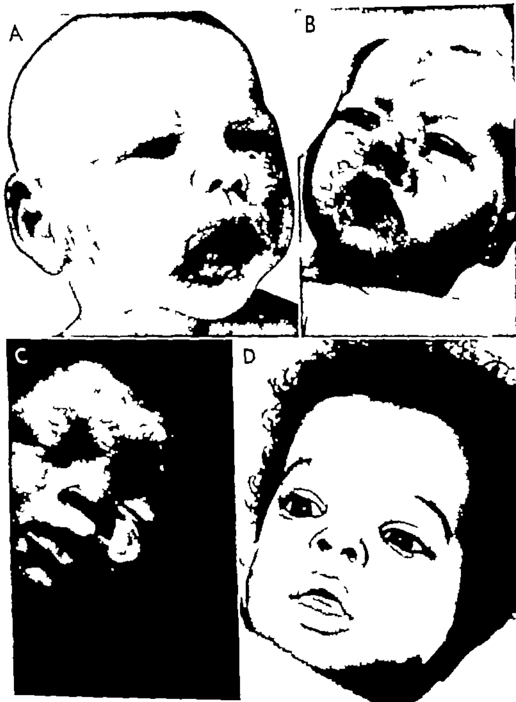


Fig. 99.—Congenital syphilis, early stage. In A and B note fissuring of lips (rhagades). In B the crusting of the nose is the result of snuffles. C, shows plainly the circinate papulosquamous syphilids on the forehead and cheeks. In D the child has saddle nose and frontal bossing. (C courtesy of The Children's Hospital, Philadelphia. D courtesy of Dr Meyer L. Niedelman.)

genital syphilis differ in several respects from acquired syphilis. In the first place, there is no primary lesion (or chancre) in congenital syphilis through which the Treponema pallidum enters the bloodstream. Instead infection is transmitted through the placenta into the circulating blood Accordingly syphilis in the fetus may be looked upon as a generalized infection one in which the visceral organs and skeletal system are involved from the very beginning.

In young congenitally syphilitic infants the distribution and grouping of the lesions are different from those seen in older children and in adults with acquired syphilis. In acquired syphilis the eruption is more or less generalized, while in the congenitally syphilitic infant the rash is localized, as will be disclosed later

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the groins and commonly at the anal margin (Fig. 100)

Syphilitic alopecia.—In this condition the hair is scanty dry brittle and accompanied by a scaliness of the scalp Patches of hair loss appear moth-eaten or as if chewed off by a rodent.

Laryngitis—Laryngitis is an early and frequent symptom It is characterized by a hoarseness and the voice may even be completely lost (aphonia) The cry of a syphilitic infant is not very loud.

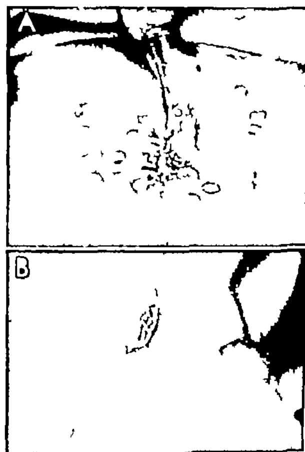


Fig 100.—Condylomata of syphilis. A, in an infant 8 months of age B in a child 5 years of age (*A* courtesy of Dr Meyer L. Niedelman *B* courtesy of The Children's Hospital Philadelphia.)

Visceral involvement—Enlargement of the liver and spleen are indicative of visceral involvement The spleen is more often enlarged than the liver These developments are diagnostically important occurring in as high as 50 per cent of cases. Enlargement of these organs should therefore, be looked for early especially in infants under the age of six months.

Nervous system changes—Syphilitic meningovascular lesions and involvement of the central nervous system are rather common in young infants. The fontanel may be tense and the reflexes may or may not be increased. The spinal fluid shows an increase in pressure and in cell count (at times even as high as 1,000 cells) The cells are mostly lymphocytes. There is also a moderate increase in the cerebrospinal fluid globulin and a type 2 colloidal gold curve not infrequently occurs. Wassermann test of the cerebrospinal fluid gives a positive result. Hydrocephalus may develop following involvement of the cerebrospinal system

Rhagades—Fissurings of the mucocutaneous junctions of the nose mouth and anus are frequently seen Ulceration with subsequent linear scars radiating from mouth or anus, is characteristic of congenital syphilis (Fig. 99 *A*) The first change is a disappearance of the line of demarcation between the skin and the mucous membrane There is infiltration reddening and roughening of this area of the skin This may be followed by a dryness and cracking and fissuring of the lips—rhagades. The fissuring is most marked at the center of the lower lip and just below the nostrils on the upper lip but it may occur on any part of the lips. After healing permanent scarring remains, which is so characteristic that upon this sign alone a definite diagnosis of syphilis can be made

Skeletal changes—Bone changes are very common and are early manifestations. Any part of the skeleton may be involved. Involvement of the osteochondral region of the long bones constitutes the most common site of the pathologic changes seen in early syphilis. Indeed a swelling at or near a joint may be the only obvious manifestation The predominant lesions are osteochondritis periostitis, diaphysitis (osteomyelitis) either localized or generalized throughout the entire shaft, and epiphysitis Periostitis is usually present later as an obvious

Bromer uses this term as covering the changes which take place in the individual centers of the tarsal bones and others that have a single nucleus and also which take place in the epiphyseal centers of the long bones In the case of these latter they must necessarily be included in the description of the changes in the endochondrial areas of bone growth of which they form part

sign in a young infant. Findlay in his series of cases found bone lesions in 25 per cent of cases and Dennie, in a study of 50 cases found that 40 per cent had no other syphilitic signs than the bone lesions.

Pseudoparalysis (Parrot).—A varying degree of paralysis may be seen. In the arm this is of the flaccid type; when the legs are affected it is of the spastic type. The infant cannot lift his arm or raise his leg and cries when someone lifts the extremity for him. This condition, first described by Parrot, is due to the pain consequent to a syphilitic osteochondritis; i.e., an inflammatory degenerative process between the epiphysis and diaphysis. The metacarpals of the hand or foot may also be involved. Usually the swelling there involves the second phalanx. Clinically the condition is known as a syphilitic dactylitis. The finger assumes a typical flask shape. Other bone changes include a thickening of the parietal and frontal bones (Parrot's nodes) in the neighborhood of the anterior fontanel resulting in "the hot-cross-bun head."

Constitutional symptoms.—Syphilitic infants are not usually very ill at the beginning. There may be mild fever, listlessness, stupor and even convulsions. Usually the syphilitic infant cries incessantly because of pain. He is restless and refuses to take his customary feeding. Soon loss in weight occurs and later the infant becomes malnourished (marasmus). The facial expression is characteristic. The skin of the forehead becomes wrinkled and the disappearance of fat gives rise to the so-called "old man's" or "old woman's" face.

LATE CONGENITAL SYPHILIS.—The late phase of congenital syphilis (lues tarda) is characterized by the appearance of new signs and symptoms that are not usually found during the newborn period. The most frequent time for their appearance is during the second dentition, although occasionally some of the late signs may not appear until puberty or even later. Gummas of the skin or other organs are seen infrequently and lesions of the central nervous system may appear as late as adolescence. Signs less frequently met with include a synovitis involving one or both knees (Clutton joints), enlarged lymph nodes (Fig. 101 A) and, still more rarely, paroxysmal hemoglobinuria.

The most important signs of late congenital syphilis are the following:

Interstitial keratitis.—Interstitial keratitis may be followed by blindness. It occurs in from 30 to 40 per cent of children with congenital syphilis. The condition appears first in one eye, then in the other and is recognized by a clouding of the cornea, which takes on a "ground glass" appearance. Conjunctivitis and pain are also present. Other eye complications include optic neuritis, optic atrophy and iritis. The "salt and pepper" fundus denotes choroiditis. Pupillary changes occur as does also retinitis.

Hutchinsonian teeth.—Characterized by notching of the upper central permanent incisors at their distal ends, Hutchinsonian teeth (Fig. 101 B) is a condition apparently brought about by an erosion of the central papilla. Such teeth are usually thickened in their anteroposterior diameter and are spaced wider apart than normal teeth, but sometimes they may resemble the end of a screw-driver or be acorn-shaped. At times the lower incisors may appear peg-shaped or bear a resemblance to miniature toadstools. Multicusp molars ("mulberry teeth") may be seen, but they are not specific for congenital syphilis since they also occur in other diseases.

Deafness.—Deafness occurs in from 8 to 10 per cent of congenitally syphilitic children and is resistant to therapy. Eighth nerve deafness may be partial or complete (total deafness). As a sign of congenital syphilis, deafness occurs more often at the time of puberty; it has nothing to do with cerebrospinal syphilis. (These three signs, namely, interstitial keratitis, eighth nerve deafness and Hutchinsonian teeth are referred to as "the Hutchinsonian triad." However, it is unusual to discover all three signs present at once.)

Bone changes.—Pathologic changes in the osseous system in late congenital syphilis are different from those occurring in the infantile form. Pendergrass *et al.* present the following roentgenographic classification of such lesions: (1) Synovitis and periarticular infiltration, (2) hypertrophic and atrophic changes in the joints with or without loose bodies, (3) diaphysitis, all bones, rarefying osteomyelitis (generalized, localized), rarifying osteitis localized (gummas)

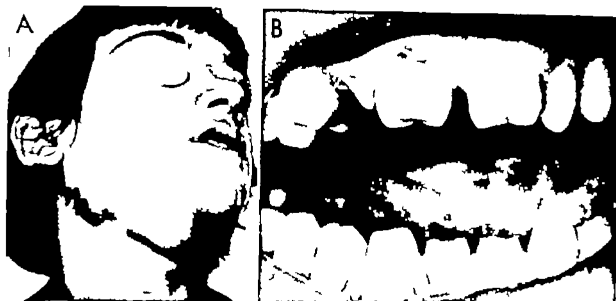


Fig 101.—Congenital syphilis, late stage. A enlarged syphilitic lymph nodes in an 11 year-old girl; B Hutchinsonian teeth. Note thickening in the anterior posterior diameter cylindrical shape and notch in center of cutting edge (*B* courtesy of Dr M G Bohrod)

condensing osteomyelitis (4) periostitis all bones, Parrot s node-skull dactylitis (5) unusual manifestations (osteitis fibrosa cystica)

Briefly the bone changes in late congenital syphilis may be summarized as follows Osteitis of the shaft of the long bone occurs and at times of the flat bone The bones are usually thickened and hard This thickening (osteitis of the tibia) gives the clinical effect of the so-called sabre shin," either of one or of both tibia. The middle third of the anterior of the border of the tibia is a typical site and its edge may be irregular as well as prominent Both tibiae may be affected Bosses of the frontal bone (Parrot s nodes) and osteoporosis are seen less frequently Growth is often stunted (Fig 102)

The inner third of the clavicle (usually the right one and more commonly affected in males) often presents definite thickening. The saddle nose already mentioned is a well-known entity Synovitis involving one or both knees (hydrops articuli Clutton s joints) and causing swelling of the joints is found in some cases (Fig. 103)

Other manifestations—At this later date linear scars about the mouth and chin reminders of the lesions of the mucocutaneous surfaces of the lips during infancy may still be seen. Gummatous changes in the skin and other organs of varying types and degree are less often encountered Laird found that gummata occurred in 17 per cent of 94 cases and that the palate and the testes are the common sites for gummata in this tertiary stage He also found gummatous involvement of the skin, healed or actively ulcerating, in 8 patients.

Involvement of the cerebrospinal system may occur In juvenile paralysis the pupils are fixed or characterized by mydriasis, optic atrophy may also occur and there is incontinence of urine. Tabes has been reported but is rare. Laird found parenchymatous neurosyphilis clinically in 6 among 93 patients, including 4 patients with juvenile tabes and optic atrophy normal findings were reported in 32 among 38 patients. Hemiplegias paraplegias, mental backwardness disorientation and convulsions have also been known to occur

A large group of children of families in which there is syphilis may show no signs whatsoever Yet these children will demonstrate a positive blood serologic reaction for syphilis or a positive cerebrospinal fluid reaction when a spinal tap is performed. Such children are said to have latent syphilis. Frequently a history of syphilis is elicited in brothers and sisters or parents of such patients. Again evidence of healed lesions—i.e signs from previous disease, such as scars on the cornea or about the mouth

—may be discovered in a careful examination of other members of the family

Diagnosis.—It should be remembered that newborn infants with syphilis may appear per-



Fig. 102.—Stunted growth in child 11 years of age with congenital syphilis (right) Notice her saddle nose. Her sister (left) 14 years of age, is free from the infection. (Courtesy of Dr Meyer L. Niedelman.)

fectly healthy at birth, without obvious signs and symptoms. As rule, signs appear befor the third month and rarely after the fourth month The following are helpful in ascertaining the presence or absence of congenital syphilis in infants apparently healthy and without obvious signs and symptoms in this period. (1) History of syphilis in either parent, (2) Wassermann and other confirmatory serologic tests on the patient and other members of the family (3) physical examination to include the skin and mucous membranes, liver and spleen, lymph glands, eyes, ears and teeth, (4) urinalysis, (5) roentgenograms of the bones (6) central nervous system survey

In the case of the stillborn infant or fetus, darkfield examination for the Spirochaeta pallida should be carried out thoroughly by a competent pathologist on scrapings from the umbilicus, liver heart or other tissues. The bones may reveal pathologic changes.

It should be remembered also that syphilitic reagins from the mother may be carried over into the infant's blood and may be responsible for a positive serologic reaction in the infant. However the passively transferred reagins will disappear from the noninfected infant's blood

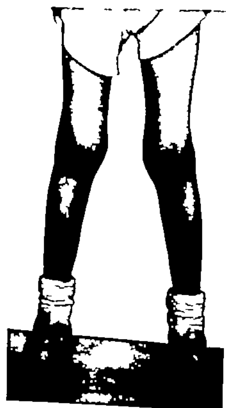


Fig. 103.—Congenital syphilis, showing Clutton joints involving both knees.

within four months after birth. If the child is infected, positivity will be sustained or will increase and will be associated with confirmatory signs of congenital syphilis. Goodwin recom-

mends that in the presence of increasing or sustained positivity or when the course of the maternal infection has been unfavorable weekly examinations of the child are desirable so that treatment may be given at the optimum time. She further states that negative findings at the age of four months are a guarantee that the infant has escaped congenital infection She suggests that in order that cases of congenital syphilis be detected the offspring of syphilitic parents should be followed for a minimum of four months after birth. This follow-up should include a monthly quantitative blood serologic test a careful physical examination and a roentgenogram of the long bones taken between the fourth and sixth weeks if possible

Differential Diagnosis.—The diagnosis of late congenital syphilis is based upon the signs mentioned earlier Confirmatory evidence is obtained by blood serologic and cerebrospinal Wassermann tests.

Because of the raw denuded areas of the skin *Ritter's disease* may suggest congenital syphilis. In the former however Nikolsky's sign is positive. The skin is quite erythematous the denuded areas resemble in color a boiled lobster On the other hand, in congenital syphilis the denuded areas of the skin are localized In *seborrheic dermatitis* the eruption does not possess the copper color of the syphilitic rash The lesions are piled up like potato chips, but are not infiltrated as in the syphilid. Seborrheic dermatitis responds to antiseborrheic therapy with ointments and creams congenital syphilis does not The *diaper rash* (ammoniacal dermatitis) as a rule is limited to the buttocks but may also occur on the thighs, abdomen and external genitalia Typical lesions are comma-shaped and superficial they lack the infiltration characteristic of the syphilid. Paroxysmal itching is a feature of *atopic dermatitis* it is minimal or absent in congenital syphilis. Edema is part of the clinical picture of atopic dermatitis the lesions of congenital syphilis are dry except in those areas where they may have become eczematized through moisture such as the groins and anal region Skin lesions in atopic dermatitis are infiltrated but lack the characteristic deep infiltration seen in congenital syphilis Furthermore, a history of allergy in other members of the family will usually be found in atopic dermatitis.

Prognosis.—It is generally accepted that infection takes place from the syphilitic mother after the third month of gestation. The fate of the fetus will depend on the virulence of the infection If the mother's infection is recently acquired and untreated (from 6 to 12 months duration) her pregnancy will in all probability result in the birth of a syphilitic infant or in a miscarriage. On the other hand if her infection is long standing (10 to 20 years) even though she has remained untreated she may deliver an apparently healthy normal baby Accordingly it may be stated that the fate of the syphilitic infant will depend on (1) the duration of the mother's infection (2) the amount of antisyphilitic treatment the mother has received and (3) the time when treatment was given to the infected mother Adequate specific therapy before or during pregnancy early treatment with antibiotics and the continuation of such treatment during pregnancy are factors which may determine the birth of a healthy infant On the other hand the outlook for a healthy nonsyphilitic infant from an inadequately treated syphilitic mother is practically nil, both as to complete eradication of the disease and the maintenance of health

Prevention.—The best, simplest and quickest method of preventing congenital syphilis is by adequate treatment of the mother as soon as the diagnosis has been made. The best time is during the first half of pregnancy indeed adequate antisyphilitic therapy at this time has been known to result in the birth of normal babies in 90 to 95 per cent of cases.

Treatment.—Penicillin is the drug of choice and should be given intramuscularly in the aqueous form The dosage, summarized in Table 18 varies according to the weight of the child. For management of the late type of congenital syphilis the same treatment is advised as for the early type

Local cortisone therapy has been found therapeutically effective in early cases of interstitial keratitis. Simpson and his co-workers, in a preliminary report on the use of cortisone acetate as an eye drop in conjunction with intramuscular injections of procaine penicillin in oil, noted improvement after the first 24 hours. Specifi-

TABLE 18.—Treatment Schedule* for Syphilis Using Benzathine Penicillin G (Bicillin)†

	Number of Injections	Interval Between Injections	Dose Each Injection	Total Dose
Congenital Syphilis				
Weight 9 lb. or less	2	1 week	0.6 mil u. (1 cc.)	1.2 mil u.
Weight 10-29 lb.	2	1	1.2 (2)	2.4
Weight 30 lb. or more	1	—	2.4 (4)	2.4
All Other Types of Syphilis (With certain exceptions such as ocular syphilis, cardiovascular syphilis with decompensation, in which individualized management is necessary.)	1	—	2.4 (4)	4

*Treatment schedule recommended by the Department of Public Health, Division of Preventive Medicine, Section of Venereal Disease Control, Philadelphia, Pa.

†Bicillin contains 300,000 units of penicillin G per cc. (aqueous suspension) with methyl paraben and propyl paraben as preservatives.

cally be used cortisone acetate 1:4 dilution with normal saline solution. Two drops were instilled locally in each eye every four hours during the waking hours, for 10 days. In addition to cortisone each patient received 600,000 units of procaine penicillin in oil with aluminum monostearate, intramuscularly daily for 12 days. Other clinicians have reported similar good results from the above regime.

Special care should be taken so that the infant is adequately nourished and that the body fluids and electrolyte balance are maintained at all times.

Acquired Syphilis

Syphilis in children is sometimes acquired. Infection may occur through blood transfusion or from close contact with syphilitic person having open lesions. The management is similar to that of congenital syphilis.

Rat-Bite Fever

(Erythema Arthriticum Epidemicum, Haverhill Fever)

Rat-bite fever is an infectious disease caused by the bite of rat. Clinically it is characterized by an inflammatory reaction at the site of the wound, the spirillar form being accompanied by lymphangitis and lymphadenitis of the adjacent lymph glands. Both forms are characterized by paroxysms of fever and a cutaneous rash. Most cases seen in this country are in infants, but any person bitten by an infected animal may develop the disease. It may be caused by one of two etiologic agents (1) Sodoku, the spirillar form, is caused by the Spirillum minus, also known as the Spirochaeta morsus muris; (2) the streptobacillary form is caused by Streptobacillus moniliformis, also known as Haverhillia multiformis or Streptothrix muris ratti. The latter was the epidemic form which was milk-borne in Haverhill, Massachusetts, in 1926.

Sodoku, the endemic, Japanese or Oriental form, is produced only by the bite of a rat or other animals. On the other hand, the streptobacillary form (S. moniliformis) of septicemia, although caused by a rat bite, may also follow the ingestion of contaminated food.

Clinical Picture.—Spirillar Form.—In the form due to Spirillum minus (Sodoku) after an incubation period of about one to three weeks, there is an exaggeration of the original wound with a development of local swelling, pain and purplish-red discoloration. A chancre-like ulcer develops. Regional lymphangitis (with red streaks) and lymphadenitis are present. There is local tenderness of the enlarged lymph nodes. A rash frequently follows, which may be either macular or papular and may be generalized although often it is restricted to the area about the wound. The rash may appear as circinate

areas on the face arms and trunk Each circinate lesion is composed of a white central area surrounded by a bluish red erythematous zone. A roseola not unlike that seen in syphilis has also been reported but it differs from the syphilitic roseola in that the lesions are found mostly on the face, neck and lower extremities. In Frank s and Perlman s patient (a 6-month-old infant bitten on the right wrist by a rat) 10 days after the patient was bitten there appeared on the face, body and extremities many circinate erythematous and purplish red lesions measuring from 2 to 5 cm with well-defined borders clear in the center and containing a secondary circinate lesion within not unlike a target. Urticarial rashes have also been reported as also has a rash on the mucous membrane of the mouth. Fever may be of the remittent or intermittent type. On the other hand afebrile periods lasting from three to nine days may occur and these may be followed by another cycle of pyrexia. The sudden rise in temperature may be preceded by a chill or a chilly sensation. Other symptoms indicative of a generalized infection may include headache, backache, and generalized pain. Arthritis, in contrast to that present in the form due to the streptobacillary organism is usually absent in Sodoku. Polymorphonuclear leukocytosis and a secondary anemia are usually present but blood cultures and the Wassermann reaction are usually negative However a positive Kahn reaction is not infrequently present. Darkfield examination of the fluids from the local lesions or from infected lymph gland material will show the presence of spirochetes.

STREPTOBACILLARY FORM —Like the spirillar form of the disease, the wound following the bite of a rat heals promptly but without induration, exacerbation or involvement of the regional lymph nodes. After an incubation period (*shorter than that of the spirillar form*) of two to ten days there is an abrupt onset with chills high fever malaise, vomiting and headache A *macular eruption appears and multiple arthritis* of varying degree and an abruptly rising fever curve (with remission) follows in from two to five days. *Witzberger and Cohen state that the* febrile episode in the streptobacillus form of rat-bite fever is much more irregular in its duration and intervals than that in Sodoku. During the afebrile period there is the same relative freedom from constitutional symptoms but with each paroxysm of fever they recur

The cutaneous lesions in Haverhill fever are much smaller in size and less numerous than those in Sodoku. *The eruption is first seen on* the extremities as macular lesions later they become petechial as is common in Sodoku. The *eruption fades during the afebrile period and* flares up during the paroxysm of fever

Diagnosis.—Diagnosis depends upon a history of a rat bite or the bite of another animal and the characteristic laboratory findings. Clinically the condition is recognized by the presence of intermittent or remittent fever a local inflammatory reaction at the site of the bite and a characteristic bluish-red exanthem. In those cases caused by the Spirillum minus, darkfield examination of the fluid from the local lesions or from the infected lymph glands will show the presence of spirochetes. However the presence of spirochetes is not essential to diagnosis. For unmistakable diagnosis of Sodoku, intraperitoneal inoculation into white mice or guinea pigs is required with repeated study of the blood, inguinal glands and peritoneal exudate of those animals. The Wassermann and other serologic reactions are positive only in the rat-bite fever due to the spirillum

Differential Diagnosis.—From a dermatologic point of view erysipelas should be differentiated In *erysipelas* the lesions are definitely demarcated and are of a dusky or bright red color with a peculiar shining appearance of the vesicles, pustules or bullae, and with high fever during the active stage of the disease.

Complications and Prognosis.—Nephritis is the chief complication. Asthenia and muscular pains are common. Other complications reported include alopecia respiratory distress and pneumonia.

With the use of penicillin the prognosis is good. Fatal cases were reported prior to antibiotic therapy In the streptobacillary forms also the prognosis is good although the disease may last for months A residual pathologic condition of the joint may occur

Prophylaxis.—Rat infested areas should be avoided When a child or infant has been bitten

by a rodent, cat or other animal, penicillin in doses of 5000 units should be administered intramuscularly every three hours for at least one day. It should be pointed out that not all rats harbor the spirochete in their mouths.

Treatment.—Penicillin is the drug of choice, given intramuscularly. It is effective against infection caused by either the spirillum or the streptobacillus. Arsenicals and the sulfonamides are ineffective against Streptobacillus moniliformis. Penicillin administered in dosage of 5000 units intramuscularly every three hours for a week or ten days seems to be adequate to control both types of infection. General measures should be ordered to relieve other symptoms.

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areas on the face arms and trunk. Each circinate lesion is composed of a white central area surrounded by a bluish-red erythematous zone. A roseola not unlike that seen in syphilis has also been reported but it differs from the syphilitic roseola in that the lesions are found mostly on the face, neck and lower extremities. In Frank's and Perlman's patient (a 6-month-old infant bitten on the right wrist by a rat) 10 days after the patient was bitten there appeared on the face body and extremities many circinate erythematous and purplish red lesions measuring from 2 to 5 cm. with well-defined borders, clear in the center and containing a secondary circinate lesion within not unlike a target. Urticarial rashes have also been reported, as also has a rash on the mucous membrane of the mouth. Fever may be of the remittent or intermittent type On the other hand, afebrile periods lasting from three to nine days may occur and these may be followed by another cycle of pyrexia. The sudden rise in temperature may be *preceded by a chill or a chilly sensation* Other symptoms indicative of a generalized infection may include headache backache and generalized pain. Arthritis in contrast to that present in the form due to the streptobacillary organism is usually absent in Sodoku. Polymorphonuclear leukocytosis and a secondary anemia are usually present, but blood cultures and the Wassermann reaction are usually negative. However a positive Kahn reaction is not infrequently present. Darkfield examination of the fluids from the local lesions or from infected lymph gland material will show the presence of spirochetes.

STREPTOBACILLARY FORM —Like the spirillar form of the disease the wound following the bite of a rat heals promptly but without induration exacerbation or involvement of the regional lymph nodes. After an incubation period (shorter than that of the spirillar form) of two to ten days, *there is an abrupt onset with chills,* high fever malaise, vomiting and headache. A macular eruption appears and multiple arthritis of varying degree and an abruptly rising fever curve (with remission) follows in from two to five days. Witzberger and Cohen state that the febrile episode in the streptobacillus form of rat-bite fever is much more irregular in its duration and intervals than that in Sodoku. During the afebrile period, there is the same relative freedom from constitutional symptoms but with each paroxysm of fever they recur

The cutaneous lesions in Haverhill fever are much smaller in size and less numerous than those in Sodoku The eruption is first seen on the extremities as macular lesions, later they become petechial, as is common in Sodoku. The eruption fades during the afebrile period and flares up during the paroxysm of fever

Diagnosis.—Diagnosis depends upon a history of a rat bite or the bite of another animal and the characteristic laboratory findings. Clinically the condition is recognized by the presence of intermittent or remittent fever a local inflammatory reaction at the site of the bite and a characteristic bluish-red exanthem. In those cases caused by the Spirillum minus, darkfield examination of the fluid from the local lesions or from the infected lymph glands will show the presence of spirochetes. However the presence *of spirochetes is not essential to diagnosis.* For unmistakable diagnosis of Sodoku, intraperitoneal inoculation into white mice or guinea pigs is required with repeated study of the blood, inguinal glands and peritoneal exudate of those animals. The Wassermann and other serologic reactions are positive only in the rat-bite fever due to the spirillum

Differential Diagnosis.—From a dermatologic point of view erysipelas should be differentiated In *erysipelas* the lesions are definitely demarcated and are of a dusky or bright red color with a peculiar shining appearance of the vesicles, pustules or bullae and with high fever during the active stage of the disease.

Complications and Prognosis.—Nephritis is the chief complication Asthenia and muscular pains are common. Other complications reported include alopecia, respiratory distress and pneumonia

With the use of penicillin the prognosis is good Fatal cases were reported prior to antibiotic therapy In the streptobacillary forms also the prognosis is good although the disease may last for months A residual pathologic condition of the joint may occur

Prophylaxis.—Rat infested areas should be avoided *When a child or infant has been bitten*

the reason that the skin of infants and children is seldom affected. Recognition of this fact does not exclude sources of infection such as public bathhouses, bathrooms or swimming pools.

Clinical Picture.—On the feet the signs vary from that of a simple erythema, perhaps associated with some itching, to macerated areas and fissures. The areas of distribution of the so-called interdigital type are between the toes, the flexor surfaces of the toes and the medial aspect of the foot (Fig. 104 C and D). In the acute phase one may find numerous vesicles varying in size from pinhead to millet seed and even larger surrounded by erythematous skin. Fissures are not infrequent and often are quite painful. Again, the affected areas may be moist and soggy or dry and scaly and accompanied by considerable itching or a burning sensation. In milder cases the lesions are often attributed to the sweating of the feet, or to failure of personal hygiene. Generally the lesions are symmetrically situated upon both feet involving all the toes, although one or two toes only may be involved. This type is sometimes referred to as the "intertriginous," "moist," or "macerated" variety of tinea pedis. The other type, the hyperkeratotic, is found less frequently in children than in adults and is characterized by its chronicity. Its areas of predilection are the palms and soles, but it may occur upon the extensor surfaces of the extremities and is often mistaken for psoriasis. The lesions are mostly dry and scaly.

Diagnosis.—The clinical appearance of the lesions is usually characteristic, especially when they are found upon certain areas such as the flexor surface of the toes, between the toes and along the inner aspects of the feet. Other areas include the intercrural region, the axillae and the gluteal cleft. Vesicles are common features of the acute inflammatory stage. Macerated, soggy areas between the toes or dry and exfoliative scaling of the soles and palms (Fig. 104 A and B) should make one suspect a fungous infection. Confirmatory evidence may be obtained by direct examination of skin scrapings treated with a few drops of a 10 per cent potassium hydroxide solution and viewed through the microscope for the presence of filaments (mycelia). Culture upon Sabouraud's medium may yield confirmatory evidence of infection. The trichophyton test with a 1:30 extract is sometimes helpful but it is not of great value since, when a result is positive, it means only that the patient has or has had tinea pedis. On the other hand, a negative result does mean that one can exclude it.

Differential Diagnosis.—From a practical point of view the most important condition with which tinea pedis may be confused in children is *dermatitis venenata*. Sometimes a differentiation is impossible without resort to special methods for identifying the fungi. However, the eruption in dermatitis venenata appears suddenly, while tinea pedis is more insidious in onset. Dermatitis venenata of the feet involves the dorsal aspects of the foot and the extensor surfaces of the toes, while tinea pedis appears more localized upon the flexor surfaces, the inner aspect of the sole and between the toes. Frequently a patch test is of considerable help in diagnosing dermatitis venenata. Too, the lesions in tinea pedis are sharply marginated; in dermatitis venenata they are not. Sometimes one finds a dermatitis venenata superimposed upon a tinea pedis, caused by overtreatment and spoken of as an "overtreatment dermatitis."

Prognosis.—With proper hygiene, keeping the infected areas of the skin dry by means of an unscented talc and the routine use of fungicidal remedies, a cure may be affected within a month or two. Reinfection frequently occurs.

Prophylaxis and Treatment.—Even though it is not certain how athlete's foot is acquired, precautionary measures should be taken to avoid contact with infected persons. Children should be discouraged from walking barefooted. Sandals should be worn at the beach and paper sandals should be used in public bathhouses or even at home.

Because of the ease with which the delicate skin of children is traumatized by chemicals and topical remedies, all applications should at first be employed with caution. Accordingly, any chemical for topical application should first be used experimentally: that is to say, it should be prescribed in lowest concentration. It is only upon cautious trial and proved results that increase in the strength of the active remedy can safely be made.

9

The Fungous Infections

BOTH SUPERFICIAL and *deep fungous infections* are encountered in dermatology. The superficial fungous infections include tinea pedis, *tinea capitis, tinea circinata, tinea versicolor* favus and Candidiasis (or moniliasis). The deep *fungous infections include actinomycosis,* sporotrichosis, blastomycosis, histoplasmosis and coccidioidomycosis. In addition there is acrodermatitis enteropathica, the exact classification for which is as yet unknown.

SUPERFICIAL FUNGOUS INFECTIONS

Tinea Pedis

(Ringworm of the Feet, Athlete's Foot)

Incidence and Etiology—The incidence of tinea pedis is reported to be high. Some clinicians assert that 80 per cent of all persons above the age of 5 or 6 years are infected. Although children under the age of 3 years also may be subjects of tinea pedis, this author does not recall having seen a single infantile infection.

The interesting question is frequently raised as to why the lesions of tinea pedis are seen so much more commonly upon the feet than upon other parts of the body. Recent research points to sweat as the answer. Fungi thrive best in the presence of moisture and sweat between the toes cannot evaporate as readily as on other parts of the body. Also it is known that the invisible perspiration present at all times between the toes has a low pH and is therefore favorable to fungous infections. Again, the stratum corneum, which in a certain sense may be regarded as devitalized tissue, forms a favorable nidus for the growth of fungi. Other areas affected are the axillae and the groins.

The responsible fungi may be the microsporum, the trichophyton or the epidermophyton. The trichophytons and microsporums may account for the inflammatory eruptions. On the other hand, the trichophytons are generally responsible for the subacute types, especially the *Trichophyton purpureum* which is less inflammatory. This produces a very low grade inflammatory reaction not productive of vesicles. A common offender in dermatophytosis pedis is the *Trichophyton mentagrophytes* frequently responsible for an acute vesicular erythematous, inflammatory condition of the feet. Secondary invasion by other organisms, either streptococci or staphylococci or both, may account for pyoderma and crusting of the lesions. These organisms are sometimes responsible for lymphangitis, a not infrequent complication of athlete's foot. In my own experience athlete's foot is seldom found in more than one member of the same family. Therefore it seems that some factor other than direct contact, probably a lowering of the individual immunologic biologic response of the host, plays an important part in its transmission. It is probably for

During the acute inflammatory stage of the infection, soothing, mildly astringent remedies are in order. A general rule to be followed without exception in the management of tinea pedis is the use of wet dressings or soaks while the skin is badly inflamed. In this respect the management does not differ materially from the exudative stage of an acute atopic dermatitis (eczema). It is only after the inflammation has been controlled that fungicidal remedies, including keratolytics, are indicated. Indeed, one of the commonest errors is the attempt to eradicate the infection too soon, and too rapidly by one or another of the many available fungicidal agents. Thus, many remedies intrinsically valuable for therapeusis fall into discredit, not because they are unsatisfactory drugs, but because the time for their application is ill-chosen or their strength decided without discrimination.

In children, secondary infection from ringworm is not infrequent. Scratching invited by the fungous lesions may result in a superimposed infection with pyococci. When pyoderma complicates the picture, the physician should attempt first to clear the secondary infection.

In the treatment of fungous infections in children, it is well for the pediatrician to be constantly mindful of the basic but often forgotten truth that he is but the servant of Nature and that in his therapy agents must not exceed in their power the need that calls them into requisition. If this fundamental principle is remembered, inflammatory reactions from the indiscreet use of remedies will be avoided. Indeed harm is often produced as a result of the therapy attempted with commonly accepted remedies, because of ignorance of the proper strengths that should be used or the correct modes of their application. Under such circumstances a better result would often be secured by the simplest of non-irritating remedies, like the simple Lassar's paste, or perhaps by a wet dressing.

The pediatrician should keep in mind, in attempting treatment of a fungous infection, that he seeks not only to destroy the fungus but to assist the immunologic response to the skin. On occasion this may be done simply by advising personal cleanliness through the use of common detergents.

The great number of therapeutic remedies recommended for fungous infections is in itself indicative of the relative inadequacy of the therapy. For this reason no attempt is made here to cover all the therapeutic regimens which have been proposed, but only to emphasize those that would seem to be particularly useful and practical.

Recently considerable interest has been shown in the use of an effective fungistatic antibiotic, griseofulvin, a metabolic product of several penicillium species—when administered orally for tinea infections affecting the hair, skin and nails. It is a specific therapeutic remedy which acts as a fungicide of the genera Trichophyton, Microsporum and Epidermophyton but it is ineffective for monilial, deep mycotic and bacterial infections. Tinea versicolor is unfavorably affected by griseofulvin. It is administered in the form of tablets, each tablet containing 250 mg. of the antibiotic. The usual adult dose is 1 Gm. daily given in divided doses *of 250 mg. four times daily.* Children receive a proportionately smaller dose. After the antibiotic is absorbed from the gastro-intestinal tract, it is deposited in the horny layer of the skin, where it exerts its fungistatic effect, thus permitting healthy keratin to replace that containing the viable but inactive pathogenic fungi. Usually infection of the glabrous skin responds to the antibiotic after 3 weeks treatment, infection of the hands and feet in 4 to 8 weeks, infection of the hair in 3 to 6 weeks and infection of the nails in 4 to 6 weeks. In some instances, the concomitant topical use of a keratolytic agent may be necessary to facilitate removal of the pathogenic fungi. Apparently there are comparatively few side effects from the use of the antibiotic and these have been of minimal importance (headache, lethargy, gastro-intestinal upset). It would seem that if the reports in the literature continue to substantiate those already noted, present-day management of tineas might be replaced by a comparatively simple and specifically effective therapeutic regimen.

SALICYLIC ACID AND BENZOIC ACID.—These agents are among the most useful fungicidal and fungistatic agents in dermatology. When they are ordered for the management of tinea pedis,

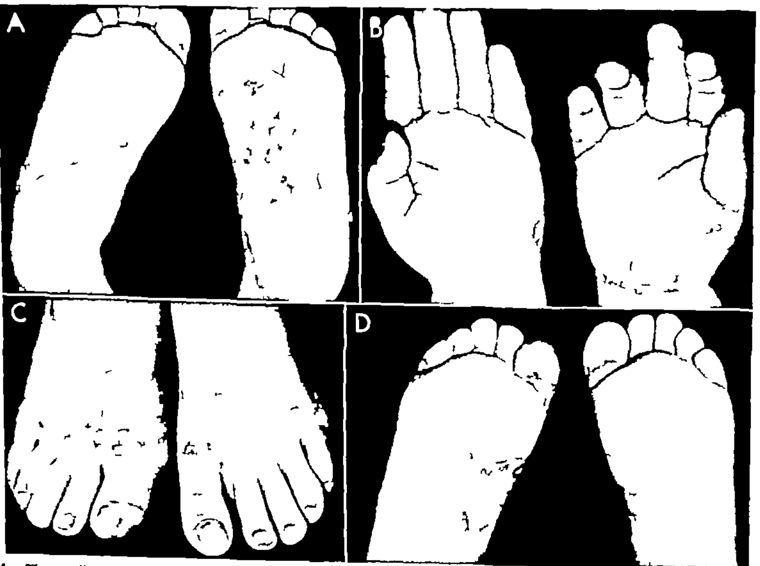


Fig. 104.—Tinea pedis. A and B of 6 months duration in an obese 5-year-old boy Note erythematous scaly plaques, sharply marginated with vesicles on plantar surfaces of both feet nd palmar surfaces of fingers and hands. Th mother lso h d dermatophytosis of fingers and h nds C nd D of two years duration in 1 year-old girl. Not sharply marginated rythematous *scaly lesions on mesial pla tar surfaces of bo h feet,* nder surfaces nd between the toes as well as on the dorsa of the feet The f her lso had thlet foot.

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the desired effect is keratolytic, for it is by this action that the peeling of the stratum corneum in which the fungi live and multiply is secured. Removal of the horny layer is the end in view; indeed it is doubtful whether either acid is a true fungicide and accomplishes more than this keratolysis.

The official Whitfield's ointment (benzoic and salicylic acid ointment) is usually too strong for children Accordingly when it is prescribed for children the official ointment should be mixed with an equal amount of Polyethylene Glycol Ointment U.S.P Begun with these proportions, the strength may be cautiously increased as the condition warrants. Whitfield's ointment should never be employed during the acute inflammatory stage instead wet dressings should be used. After the acute inflammatory stage has subsided (subacute) and for the chronic stage, Whitfield's ointment in proper strength is, in my opinion one of the best remedies A small portion of the ointment is applied between the toes and on the other lesions by means of gentle inunction every night for one month. A *fresh pair of white cotton socks or a suitable* gauze bandage is used to hold the ointment in *place. In the morning the feet are soaked in a so*lution of sodium hyposulfite 1 tablespoonful to 2 *qt. of water for 20 minutes during which the* toes are separated so that the solution reaches the interdigital spaces. The skin is then dried (not rubbed) gently and a dusting powder of unscented talc or of equal quantities of talc and bentonite is used freely upon the toes and upon other affected areas. If after one month of conscientious care the condition is unimproved the strength of the Whitfield's ointment is increased while the sodium hyposulfite soak is continued It is important to keep the affected parts as dry as possible, since fungi thrive in the presence of moisture. The socks should be changed several times daily and sterilized by boiling

Superficial fungous infections affecting other *areas of the body such as the axillae (ery*thrasma) and intercrural areas (tinea cruris) *are similarly treated Salicylic acid may be pre*scribed in solution of 70 per cent alcohol In deed this prescription is preferred by many who *feel that the alcoholic aqueous medium is more* penetrating than the ointment base. Sometimes, *the combined use of benzoic acid and* salicylic acid in alcohol is referred to as Whitfield's tincture. Usually *three strengths are* ordered

PRESCRIPTION	CONCENTRATED STRENGTH	HALF STRENGTH	1/3 STRENGTH
Benzoic acid	12.0	6.0	3 0
Salicylic acid	6.0	3 0	1.5
Alcohol (70%) q.s. ad	100 0	100.0	100 0

As with the Whitfield's ointment, initial treatment should begin with the milder strength of the alcoholic solution and be gradually increased to the higher concentration if that is necessary

THE SATURATED AND UNSATURATED FATTY ACIDS (ACETIC PROPRIONIC, CAPROIC, CAPRYLIC, LACTIC, UNDECYLENIC ACID ETC.) —In 1938, *Peck and Rosenfeld demonstrated that several* of the lower fatty acids (saturated mono-basic *acids) found in sweat are fungicidal In a second study these same investigators together with* Leifer and Bierman demonstrated the presence and action of acetic, propionic, caproic, caprylic, lactic and ascorbic acids. Further they showed that to be effective these acids must be present in certain concentrations. Undecylenic acid (also known as hendecenoic and undecenoic acid) is an example.†

THE ROSANILINE AND OTHER DYES.—The rosaniline dyes (triamino-triphenyl-methane) represent a group of chemical compounds which are toxic to gram-positive bacteria. These dyes include gentian violet (a poorly defined mixture of violet rosanilines) crystal violet, brilliant green and basic *fuchsin Many of these dyes are* bacteriostatic but not bactericidal. Acid fuch*sin is effective mainly against gram-negative* bacteria. Basic fuchsin, like all of the other tri-

Benzoic and Salicylic Acid Ointment (Whitfield' Ointment) U.S.P XV ed contains 6 per cent benzoic acid 3 per cent salicylic acid and polyethylene glycol ointment.

†A popular proprietary preparation for the treatment of tinea pedis and other superficial fungous in*fections f the skin is Desenex Ointment Zincundecat* N N D Another preparation belonging to the proprionate-caprylate mixtures is the Sopronol propri*onate-caprylat compoundr .e Sopronol Propionate-*C prylat Compound Ointment N N D and the dusting powder Sopronol Proprionat -C prylate Compound N N D

phenyl methanes, is effective mainly against gram-positive bacteria and to be effective against gram-negative bacteria must be used in 150 times the concentration of that employed for the former. Among the dyes of importance in dermatology are gentian violet, basic fuchsin and brilliant green.

It was Castellani who hit upon the idea of using dye for the treatment of tinea. His carbol-fuchsin paint has continued to be very popular in the treatment of tinea. This paint as he originally devised it is prepared as follows:

℞	
Saturated alcoholic solution of basic fuchsin	10 cc.
5% Aqueous solution of phenol	100 cc.
Filter and add	
Boric acid	1 Gm.
Add after two hours	
Acetone	5 cc.
Wait two hours and add	
Resorcinol	10 Gm.

The finished product should be kept in a dark-colored, glass-stoppered bottle. It is to be applied to the affected parts, according to circumstances, several times a day or perhaps every other day or again upon less exigency twice a week. In the presence of an acute inflammatory condition, the paint may be adapted by dilution with an equal amount of water. Again, according to Castellani, certain exceptional cases seem to respond better when resorcin is omitted.

THE TARS.—Among the tars, the wood tars (pine, juniper and rectified oil of birch tar, the latter also known as Oleum Rusci) are popular with many dermatologists. The juniper tar is Oil of Cade. Coal Tar Solution, U.S.P., better known by its older name of Liquor Carbonis Detergens, is a 20 per cent coal tar with 5 per cent polysorbate 80 and a sufficient quantity of 95 per cent alcohol to make 100 cc. of the finished product. These tars in addition to having fungicidal properties are also antipruritic, a fact which renders them distinctly valuable in the treatment of tinea pedis. The tars should be reserved for the more chronic cases, used in very mild concentrations at first and not prescribed for acute manifestations.

SILVER NITRATE.—A 0.5 to 1 per cent solution of silver nitrate may be used as a wet dressing for acute tinea pedis. Pustular lesions respond most satisfactorily to such treatment.

POTASSIUM PERMANGANATE.—This is a powerful oxidizing agent, astringent and germicide. One 0.3 Gm. tablet of potassium permanganate dissolved in 3 qt. of water will make a 1:10,000 solution satisfactory for warm soaks and should be employed for 15 minutes night and morning. Potassium permanganate is particularly useful in the management of acute vesicular eruptions. Immersion baths of 1:10,000 to 1:20,000 are most useful in treating extensive areas of ringworm of the glabrous skin. These baths, taken twice daily, should be followed by inunction with a mild ointment.

SODIUM HYPOSULFITE (SODII THIOSULFAS N.F.).—This is used as a soak in the treatment of dermatophytosis of the feet and other areas of the skin. One tablespoon of the crystals should be dissolved in 3 qt. warm water in which the feet should be immersed for 15 minutes morning and night. Afterwards the skin should be carefully dried and dusted, especially between the toes, with a mildly antiseptic powder. A 10-25 per cent solution of sodium thiosulfate, applied in the form of wet dressings, is one of the most useful preparations for the treatment of tinea versicolor.

SULFURATED LIME SOLUTION (N.F.) VLEMINCKX'S SOLUTION.—Some investigators have reported clinical improvement from sulfurated lime solution for tinea pedis. It should never be applied in full strength but used diluted in the proportion of 2 to 4 teaspoonfuls to the pint of water as a soak for 20 minutes to half an hour morning and night. A soothing dusting powder should be used after application. Vleminckx's solution should be used freshly prepared as it deteriorates on standing; its action depends upon the nascent sulfur present when it is recently made.

See Formulary: ℞ 9 as bath, 25 for acute inflammatory stage; 54, fungicidal for acute, subacute and chronic stages, 55, keratolytic for subacute and chronic stages.

In preparing solution of potassium permanganate it should be remembered that the crystals must be thoroughly dissolved before use as an immersion bath or soak, otherwise the undissolved crystals may cause chemical burn.

Tinea Capitis

(Trichophytosis Capitis, Ringworm of the Scalp)

Ringworm of the scalp is a contagious disease generally caused by the animal (zoophilic) or the human (anthropophilic) type fungus and less frequently by different types of trichophytons The infection involves not only the horny layer of the skin and hair but also the horny layer of the hair follicle of the root hair and the hair shaft.

Etiology—Ringworm of the scalp in the United States is usually due to infection with the microsporons The human type (*Microsporum audouini*) of this fungus is pathogenic for children by transfer from one to another It is only occasionally met with among adults and never among the lower animals. The animal type (*Microsporum lanosum* and *Microsporum fulvum*) is transferred to children usually by puppies or kittens. There appears to be far less possibility of acquiring this type of infection from older cats or dogs. Lewis and Hopper state that at the Skin and Cancer Hospital, New York in 1937 the *Microsporum lanosum* and the *Microsporum audouini* shared incidence equally as causative fungi and together accounted for about 80 per cent of all cases of infection of the scalp in children Formerly most cases of ringworm of the scalp in children in the eastern part of the United States were of the human type, while those in the mid western and southern states were mostly of the animal type, but within recent years this proportion has been changing in favor of the human type of fungus Trichophytons also may be responsible.

Most cases of ringworm of the scalp are seen in children under the age of 10 years and the average age of affected children is reported by Mitchell to be between 7 and 8 years. In the Hagerstown Study Schwartz and his co-workers found six times as many boys as girls infected with tinea capitis. Improperly disinfected toilet articles, such as scissors, combs and brushes may transfer the infection as also may the cap when it is exchanged among school boys. The seat tops in moving picture houses and subway cars have [illegible] especially incriminated.

The endocrines are generally held to be responsible for the spontaneous cure of tinea capitis at the time of puberty or soon after Rothman *et al* have shown that in the post-puberty period as at the onset, the glands of the scalp secrete a substance which contains, in higher concentration than before puberty low boiling saturated fatty acids with selective fungicidal and fungistatic action on the *M Audouini*. These fatty acids, which are present in greater concentration in the hair fat in adults (pelargonic acid tridecanoic acid) are probably responsible for the so-called spontaneous cure of ringworm of the scalp in adults.

Clinical Picture—The human type of ringworm of the scalp (Fig. 105) is characterized by one or more circumscribed areas of hair loss. At first the hair loss is small a patch perhaps not more than 1 or 2 in. in diameter This patch may be single although usually several such areas may be found, sometimes close to each other or scattered irregularly throughout the scalp Upon close examination of the patch, the affected hairs appear lustreless and characterized by broken-off stumps. Any attempt to remove them with tweezers usually causes them to break, because they lack the elasticity of normal hair Upon inspection each plaque is seen to be covered with fine grayish white scales through which protrude a number of the broken off hair stumps. In contrast to the animal type of infection there is little or no inflammatory reaction, except perhaps in the very earliest stage. Each plaque enlarges by extending peripherally so that the original lesion, which at the beginning measured an inch or two may after a week or two be extensive or even cover the entire scalp. By coalescence, several of the lesions may fuse giving rise to polycyclic figures.

At the beginning it is difficult to determine with any degree of certainty whether the infection is of the human or animal type since clinically both types of infection are resemblant As the lesions progress, however the animal type is demarcated more sharply and is accompanied by an inflammatory reaction whilst the hair follicles become more prominent (folliculitis)

Kerion is an acute inflammatory pustular type of ringworm of the scalp (Fig. 106) Kerion is most often seen in the animal type of infection (M lanosum M fulvum) less frequently in the human type of infection (M audouini)

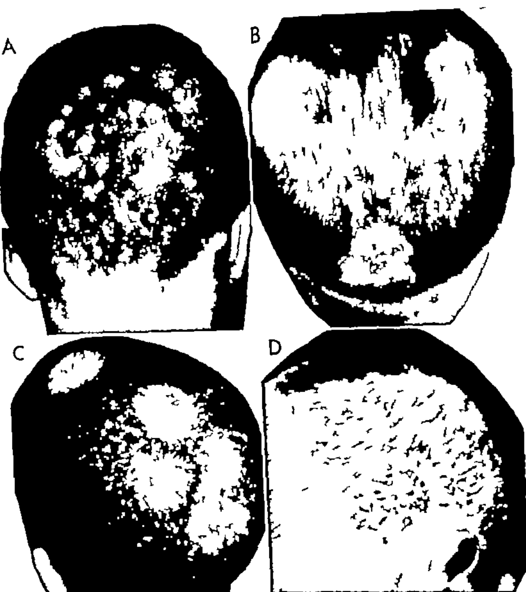


Fig. 105.—Tinea capitis (human type) A, in boy B in boy C, in boy and D due to Trichophyton ferrugineum, in which the infected hairs fluoresce as whitish green stubs. (*A* courtesy of Dr Meyer L. Niedelman, *B* courtesy of Dr Reuben Friedman, *C* courtesy of The Flower and Fifth Avenue Hospitals, New York, *D* by permission from Lewis, George M., *et al* *A Introduction to Medical Mycology* [4th ed Chicago The Year Book Publishers, Inc., 1958].)

Also it may be caused by the *M* crateriforme and other fungi. Its lesion appears as a tumefied edematous *swelling which upon close inspection* is seen to be made up of a large number of



Fig 106—Kerion. Note the boggy area on the posterior area of the boy's scalp (Courtesy of Dr Chaim Berlin, Tel Aviv)

follicular openings through which occurs a discharge of pus. Spontaneous cure usually follows.

Not infrequently in the animal type of ring worm of the scalp small circinate lesions are found upon the forehead, face and neck. The lesions of the scalp caused by the trichophyton like those due to the animal fungus, are characterized by one or more rounded erythematous spots which are frequently overlooked unless children are examined closely The initial redness disappears after a short time and is then *followed by a bald spot, the surface of which is* characterized by numerous black dots marking the broken off infected hairs at the follicular openings. Still the alopecia is not complete for numerous normal hairs persist even throughout the plaque. In other instances abundant scales and crusts may also be found As a matter of fact, the crust indicating a perifollicular reaction is caused by the secondary invaders. Also *well-defined kerions may* be seen In some children, the lesions may become eczematized.

The *eyelashes and eyebrows* should be examined routinely by means of the Wood light in every case of ringworm infection of the scalp, since several instances of ringworm infection of those structures have been reported in the literature.

Diagnosis.—Circumscribed areas of alopecia as well as any inflammatory reaction of the scalp call for examination by *means of the Wood filter* microscopic examination of typical infected *hairs for mycelia* and culture upon Sabouraud's medium A confirmatory diagnosis of ringworm of the scalp can be reached by epilating one or more of the infected hairs placing them upon a glass slide and applying a few drops of a 10 to 15 per cent potassium hydroxide solution. Let a glass cover be placed over the hairs. If after a *few minutes*, examination under the microscope should disclose the presence of mycelial threads, *they are diagnostic of fungi and a culture of the* infected hairs upon Sabouraud's agar will disclose the type of fungus present.

The Wood light is of value not only in detecting the presence of ringworm of the scalp, but also in determining the limits of the infection Hairs infected with the microsporum group of fungi will show a green fluorescence under the Wood filter Trichophytons as a rule *do not fluoresce under the Wood light. (See* Fig 105 *D*)

Differential Diagnosis.—Many conditions simulating tinea capitis can immediately be ruled out by the preservation of the normal length of the hair in all those diseases and the absence of short friable or broken hairs so characteristic of ringworm infection. However there are several diseases that should be carefully differentiated.

In *alopecia areata* the circumscribed areas of *hair loss occur suddenly and* present a uniformly smooth appearance The bald spots are shiny not inflamed. There are neither broken off hairs nor scales. A history of infection by ringworm is absent and the Wood filter yields no fluorescence. At the edge of the lesions each hair stands out prominently like an exclamation point *Favus is characterized by numerous cup-shaped* crusts (scutula) scattered throughout the scalp and a history of contagion in other members of the family The infected hairs present a greenish straw-colored fluorescence under the Wood light Microscopic examination and culture of

the infected hairs reveal the fungus *Achorion schoenleini*. *Trichotillomania and trichokryptomania* usually occur upon the anterior part of the scalp. There is no fluorescence under the Wood light and mycologic examination of the hair with potassium hydroxide solution fails to disclose mycelial threads. *Impetigo contagiosa of the scalp* may be mistaken for the acute type of tinea capitis, but the crusts are superficial in impetigo, the hairs do not fluoresce under the Wood light and culture reveals no fungi. In *syphilitic alopecia* the areas of hair loss are irregular and present a moth-eaten appearance. The hairs are not easily broken and short stumps, like those in tinea capitis, are absent. In syphilis the hair loss is gradual. There is no inflammatory reaction of the skin but other signs of syphilis are present. A history of syphilitic infection in one or both parents can usually be elicited and the blood serologic reaction is positive.

Complications.—Dermatophytids (microsporids, trichophytids) first described by Jadassohn in 1911 are lesions consisting of minute follicular papules, lichenoid or scaly symmetrically distributed upon the trunk and upon the upper and lower extremities, and sometimes grouped (Fig. 107). They are seen in kerion, in favus, and in tinea capitis unassociated with kerion. They are supposed to represent an allergic response to the focus of the infection upon the scalp by the medium of toxins disseminated through the blood stream. Dermatophytids have occurred after too energetic treatment of the scalp and have also been observed following roentgen ray epilation. When grouped in oval-shaped plaques, they somewhat resemble the lesions of lichen scrofulosorum but the tuberculin test gives negative result and roentgen examination fails to disclose tuberculous lesions in the lungs. Trichophytids are not infrequently accompanied by mild constitutional symptoms, such as slightly elevated temperature, anorexia and generalized adenopathy. The spleen may be enlarged and leukocytosis may be present. The lesions usually disappear spontaneously. Variously the pinhead sago-seed lesions may be vesicular pustular spinous and even scaly.

Prognosis.—Atrophy and scarring may follow certain types of ringworm infection. Spontaneous cure usually occurs in both types at or soon after puberty. However tinea capitis caused by Trichophyton violaceum may persist for months or even years. Kerion is usually followed by spontaneous cure. Fungous infections that produce an inflammatory reaction of the scalp usually eventuate in a spontaneous cure.

Prophylaxis and Treatment.—Comparatively little practice is needed to detect infected hairs under the Wood light and every pediatrician should possess one. Cleveland states categorically that hairs which fluoresce characteristically under Wood's light are actively infected with

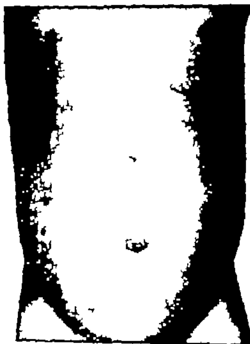


Fig. 107.—"Id" reaction in boy 6½ years of age who was treated for tinea capitis. Note the numerous minute vesicles and papules the size of pinhead or larger. They appeared in showers on the face, forehead and upper and lower extremities as well as on the chest, abdomen and trunk.

living fungus and are therefore capable of transmitting infection to others.

Most schools now possess a Wood light so that the trained school physician and nurse are able to recognize infected hairs. Routine periodic examination of all school children by this means should be carried out once every three months.

Also it may be caused by the *M* crateriforme and other fungi Its lesion appears as a tumefied edematous swelling which upon close inspection, is seen to be made up of a large number of



Fig 106—Kerion. Note the boggy area on the posterior area of the boy's scalp (Courtesy of Dr Chaim Berlin, Tel Aviv)

follicular openings through which occurs a discharge of pus. Spontaneous cure usually follows.

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nd human types of tinea capitis, 48 55 83 92, for animal and human types of tinea circinata.

Tinea Circinata

(Ringworm of the Glabrous Skin, Tinea Corporis, Trichophytosis Corporis)

Ringworm of the glabrous skin is a contagious disease characterized by one or more annular lesions the borders of which are raised (vesicular) The body of each lesion presents several concentric rings with clearing of the central part. It may coexist with tinea capitis, neck, the hairs of the scalp should be examined by means of the Wood filter The trichophytons as a rule do not fluoresce under the Wood light.

Clinical Picture.—The primary lesion may be either a tiny red macule or a slightly raised papule, usually found upon the exposed areas of the body face, neck or upper extremity although any part of the body may be affected. The most common type of ringworm of the body is the dry or macular type. The lesions are few in number usually a single lesion. At times two and even three lesions may be found,

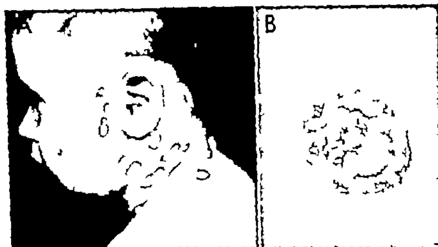


Fig. 108.—Tinea circinata. A shows multiple lesions, which [illegible] unusual. B of one month's duration in boy 10 years of age The boy contracted it from his brother who was being treated for tinea capitis (M. audouini) Note the peripheral raised border of vesicles and the tendency for the circinate lesion to clear in the center A ring within ring is clearly seen. (A courtesy of Dr John C. Belisario. Photography M Woodward Smith, Department of Artistry University of Sydney)

Etiology.—Ringworm of the skin may be contracted from animals or from other human beings. Household pets, particularly kittens and puppies, are common sources of transmission of the Microsporum lanosum (animal type) fungus to children. Accordingly when children contract ringworm, inquiry should be made regarding animals in the home. Direct contact with infected playmates constitutes the other source. The human type of fungus, Microsporum audouini secondary to infection of the scalp (tinea capitis) has been in this author's experience a frequent source of ringworm of the face and neck. When lesions are found upon the face and but seldom are there more than half a dozen (Fig. 108 A). They appear as discrete, pinkish to reddish, disk-shaped patches, varying in size from a small pea to a quarter of a dollar or even larger The circinate, coin-shaped red patches appear upon a level with the rest of the skin, or only slightly elevated above it. Some scaliness appears at the center The lesions gradually enlarge by spreading peripherally so that within a week or two, circumscribed, circinate, coin-shaped lesions are well defined. The center of the lesion is paler than the periphery and the scaliness also is greater toward the peripheral area. Closer inspection will show several red-

All infected children should be kept away from others uninfected. Those receiving treatment while attending school should wear a skull cap a beret or an improvised cap at all times to preclude the spread of the infection. The cap should be disinfected by boiling. Outside the school the board of health should assume the responsibility of protecting the public by frequent visits to barber shops to inspect clippers scissors combs etc Barbers should be prohibited from cutting the hair of children who have or are suspected of having ringworm infection The housing of stray animals also should be discouraged Certainly newly acquired pets should be examined carefully for the presence of skin infection, both grossly and by means of the Wood light In order to minimize infection in moving picture houses, trains and other public places, it is suggested that children wear hats Fungicidal treatment for children infected with tinea capitis is valuable in preventing the spread of infection to other children and may prevent the spread of the infection to uninvolved areas of the scalp in which they are used

Treatment will of course, depend upon the type of fungus responsible. For the *animal type* localized in small areas on the scalp manual epilation by a pair of forceps under the Wood light and the use of adhesive plaster (or both) twice weekly followed by application of a standard fungicide works very well. If conscientious treatment by these means for several months fails to cure the infection roentgen therapy by a skilled dermatologist should be tried If on the other hand, the patient is approaching puberty conservative treatment should be continued patiently with the hope that a spontaneous cure will occur

For the *human type of fungus*, every child should first be given the advantage of topical therapy continued for at least four or five months. If after this time there is little or no improvement, roentgen therapy should be resorted to

Before permitting the child to return to school I require that two examinations, two weeks apart show no evidence of the fungus both under the Wood light and on culture.

Manual epilation has been advocated for small restricted areas of the scalp and it is generally agreed that it is a valuable adjunct in the local management of tinea capitis.

(See also discussion of griseofulvin p 271)

SATURATED AND UNSATURATED FATTY ACIDS.—Undecylenate-undecylenic acid and propionate-proprionic acid ointments, both fungistatic and fungicidal, have been employed in the treatment of tinea capitis.

SALICYLANILIDE OINTMENT —Schwartz and his co-workers have reported their results in controlling an epidemic of ringworm of the scalp by treating the disease only with topical applications of a 5 per cent salicylanilide ointment in carbowax 1500 a mixture of polyethylene glycols having an average molecular weight of about 500 This epidemic was controlled within one year without barring infected children from school or other public places.

ESTROGENS.—There is no certain answer to the question of why a child afflicted with ringworm of the scalp nearly always recovers when he reaches puberty The large increase of sex hormones at puberty suggests that they may be effective elements, but granted their role the mode of their operation is unknown Combleet attributes the activity of ringworm of the scalp in pre-pubescence to estrogen insufficiency Diethylstilbestrol and Theelin have been employed experimentally without satisfactory results.

ROENTGEN THERAPY EPILATION —TINEA capitis due to the Microsporum audouini and favus is probably the only justifiable indication for roentgen therapy in children and then only after all other methods have been given a thorough trial and failed. Nevertheless, x-ray epilation is impractical for treating large numbers of children for tinea capitis in epidemic form, for its use should never be entrusted to the novice. Always it is to be employed by those only who have had adequate training and experience in this field. X rays are not fungicidal. Eighteen to 21 days following x ray epilation, the treated hairs fall out carrying with them the fungi and their spores. When x ray epilation is properly carried out regrowth of hair occurs after several months

See Formulary ℞ 44 for prophylaxis after manual and roentgen ray epilation tinea capitis 48 49 50 51 52, 55 83 92 for animal

salts, undecylenic acid and potassium permanganate (pp. 272 274) soaks or baths.

IODINE.—Iodine is considered the remedy of choice by many dermatologists. It may be prescribed in the form of the Tincture Iodine (per cent) U.S.P It should be applied to the lesions by means of a cotton applicator or a camel's hair brush twice daily on alternate days for a total of six applications. Or a 5 per cent iodine ointment in lanolin may be rubbed into the lesions three times daily

SULFUR.—Sulfur ointment (15%) U.S.P is a satisfactory remedy It should be applied by inunction three times daily A 3 per cent precipitated sulfur 3 per cent salicylic acid in petrolatum base may be used instead of the official sulfur ointment, applied three times daily

WHITFIELD'S OINTMENT (benzoic and salicylic acid ointment U.S.P) —This consists of 6 per cent benzoic acid, 3 per cent salicylic cid in polyethylene glycol ointment U.S.P It should never be ordered in full strength for children, but diluted in the proportion of 1 part of the official ointment to parts of petrolatum and applied by inunction three times daily

AMMONIATED MERCURY (white precipitate) —This remedy may be prescribed as the official Ammoniated Mercury Ointment (5%) U.S.P to which may be added a 3 to 5 per cent salicylic acid, or 5 per cent ammoniated mercury and 5 per cent salicylic acid may be ordered in petrolatum base, to be applied three times daily

COPPER SALTS —The old-fashioned way for treating ringworm was to immerse copper penny in vinegar (dilute acetic acid) and thus secure mild copper acetate. The penny was then applied directly to the ringworm lesion with therapeutic effect. Dalibour water which contains copper sulfate and zinc sulf te in camphor water is also a useful remedy It should never be used in full strength, but diluted at least 1 part to 16-20 parts of water and applied as wet dressing upon several thicknesses of gauze several times daily

UNDECYLENIC ACID OINTMENT COMPOUND N F —This remedy contains 5 per cent undecylenic acid, 20 per cent zinc undecylenate in polyethylene glycol ointment. It may be applied several times daily Various proprietary preparations containing the saturated and unsaturated fatty acids in ointment form may be prescribed instead. These should be applied to the lesions several times daily

(See also discussion of griseofulvin, p 271)

Representative Prescriptions

℞
Resorcin (1%)	0.3
Zinc oxide ointment	30 0

Misce et fiat unguentum
Signa: Apply three times daily

(Lust Levinsohn)

℞
Anthralin Ointment N.N.R. (0 25%) 60 0
Signa: Apply once daily (Caution—around eyes —irritation skin)
Indication Active therapy

(Lewis and Hopper)

See Formulary ℞ 10 antiphlogistic for highly irritated skin 19 44 47 48 53 54 and 83 active therapy

Tinea Versicolor

(Pityriasis Versicolor Chromophytosis)

Tinea versicolor is a superficial affection of the epidermis characterized by dirty yellowish or fawn-colored scaly lesions caused by Microsporon furfur (Malassezia furfur)

Etiology—The condition, which is only mildly contagious, may be contracted through lack of proper personal cleanliness. Contaminated underwear towels and pajamas are possible sources of infection. I know of several cases acquired by bathing in lakes and at swimming pools. It is more common during warm weather It may be seen at both extremes of life although occasionally met with in younger chil dren, it is rare in infants.

Clinical Picture.—The lesions appear as rounded or irregular circumscribed macules of various sizes and colors from a dirty yellow to dark brown, or even slightly red. The lesions may remain discrete or become confluent. In dark-skinned persons the macules are a lighter color than the surrounding normal skin, the lesions appearing depigmented. Close inspection shows the circumscribed areas to be slightly

dened rings, arranged concentrically within the outermost border. Generally the outermost margin of the lesion is sharply defined so that it appears as a raised border topped by a series of small vesicles (Fig. 108 *B*). This latter sign constitutes one of the chief criteria for diagnosis of tinea circinata. Indeed some clinicians would hesitate to make a definite clinical diagnosis of tinea circinata in the absence of the vesicular border. Furthermore, when two or more circinate lesions are situated close to each other the borders of the lesions may merge, giving rise to polycyclic figures.

The lesions of ringworm occurring upon intertriginous areas such as the groins and axillae where there is considerable moisture and irritation of the skin are apt to be vesiculopapular with considerable exudation or even suppurative. Occasionally ringworm in children assumes the form of a deep-seated infiltrated granuloma resembling a kerion. The dorsum of the hand is a favorite site but any part of the skin may be involved. This lesion first described by Majocchi under the name of "granuloma trichophyticum" is often characterized by a discharge of pus and blood.

Diagnosis.—Generally the diagnosis of ringworm of the body is comparatively simple. A single lesion or several circinate, disk-shaped lesions that begin as tiny red macules or slightly raised papules, enlarging by peripheral extension with a clearing of the center, scaliness and a vesicular erythematous border usually signify ringworm. A history of contagion is frequently obtained. Confirmatory evidence may be secured by scraping the lesion, applying a few drops of 10 per cent potassium hydroxide to the scales and examining them for mycelial threads under the microscope. Culture upon Sabouraud's medium will disclose the fungus. Upon the glabrous skin a Wood filter will often demonstrate a fluorescence of the infected lanugo hairs.

Differential Diagnosis.—Ringworm of the glabrous skin may be confused with atopic dermatitis, pityriasis rosea, psoriasis, seborrheic dermatitis and granuloma annulare.

In atopic dermatitis (infantile eczema) the itching is of greater severity than in ringworm. The lesions show greater infiltration and a tendency to merge into the surrounding skin, the well-defined raised border of ringworm is absent. Microscopic examination of the scales and culture upon Sabouraud's medium will determine the diagnosis. The herald spot of *pityriasis rosea* is frequently mistaken for ringworm. However the border of the circinate or oval-shaped lesion is pink (or salmon colored) not red as in ringworm and the scaliness is definitely less. Pityriasis rosea runs a self limited course while tinea may continue indefinitely if untreated.

Psoriasis in children is usually of the generalized papular or guttate type not circinate as in ringworm. The symmetrical arrangement of the lesions with characteristic heaped-up lustrous micaceous scales and bleeding points obtained by a gentle scraping of the lesion are diagnostic. In *seborrheic dermatitis* the predilection of the lesions for those areas well endowed with sebaceous glands such as the scalp, eyebrows, behind the ears, the nasolabial folds, sternum, umbilicus and over the vertebral column is of considerable diagnostic help. The scales in seborrheic dermatitis are of a yellowish color instead of reddish as in ringworm and are greasy to the touch and more abundant than in tinea corporis. *Granuloma annulare* is commonly mistaken for tinea circinata by the inexperienced. It begins as a nodular infiltrated lesion which extends peripherally in the form of a circle. The margin of the lesion is frequently nodular and slightly elevated with a slightly depressed purplish to faintly reddish base. There are no scales as in ringworm and no vesicles at the border of the lesion.

Treatment.—Children with ringworm of the skin should not be permitted to attend school or places of amusement or to make contact with uninfected playmates until all evidence of active disease has disappeared. When ringworm is present in puppies and kittens the animals should receive active therapy for the infection and under certain conditions should be removed from the home.

Cure can generally be obtained within a few weeks by the proper use of fungicidal and fungistatic remedies but if untreated ringworm may continue indefinitely. Topical remedial agents of value include iodine, sulfur, Whitfield's ointment, ammoniated mercury, copper

solution will disclose no mycelia or spores like those characteristic of tinea versicolor

The depigmented, irregular and asymmetrical patches of *vitiligo* are commonly seen upon the forehead, face, the dorsa of the hands, and external genitalia of the male areas of the skin seldom affected by tinea versicolor The margin of the lesions is hyperpigmented, but there is no scaling. Under ultraviolet light the vitiliginous areas appear as a characteristic white fluorescence *In seborrheic dermatitis* the patches are of an erythematous yellowish tint, the scales greasy and pliable The scales in tinea versicolor are furfuraceous, i.e. they resemble bran.

Prognosis.—A spontaneous cure is rare. Recurrences are due to either inadequate treatment or new infection There is no permanent immunity

Prophylaxis.—All members of family having lesions of tinea versicolor demonstrated either grossly or under ultraviolet light should be treated at the same time. Private towels should be used by the patients and should be disinfected by boiling. Underwear also should be disinfected by boiling. Dry cleaning may be employed for outer garments.

Treatment.—The fungus, located in the stratum corneum, may be extirpated by the thorough application of fungicidal remedies. The use of such preparations should be continued for at least two weeks after full evidence of clinical cure has been achieved. I have had good results from the following regimen. (1) All members of the family are examined grossly and under ultraviolet light. All members found to be infected are treated at the same time. (2) An initial warm bath employing tincture of green soap and a moderately stiff hand brush is followed by the application of vinegar which is left on the skin as a wet dressing from 20 minutes to half an hour nightly before the skin is dried. (3) A 10 to 20 per cent solution of sodium thiosulfate is then applied as a continuous wet dressing for 0 to 30 minutes and the skin is again dried. (4) The following ointment is then applied by inunction

℞

Salicylic acid (3)	3 6
Precipitated sulfur (3%)	3 6
Hydrous wool fat	8 0
Rose water ointment	
(about rose oil) q.s.	120 0

Misce et fiat unguentum

Signa Thorough application nightly

This ointment alone is continued for two weeks after all clinical evidence of the disease has disappeared. (A clinical cure includes negative findings from scrapings, absence of fluorescence under the Wood light and freedom from clinical signs.)

See Formulary ℞ 8, as daily bath (adjuvant therapy) *46 for active stage, but using* caution around eyes; 55 81 for active therapy and 82, to be diluted with equal parts of alcohol, for active stage followed by dusting skin with a fine talc.

Favus

(Honeycomb Ringworm, Tinea Favosa)

Favus is a chronic contagious disease caused by a fungus, usually the Achorion Schoenleinii. The infection is usually limited to the scalp, but it may attack the nails or glabrous skin and upon rare occasions the gastro-intestinal mucosa. During its early stages, favus may be easily overlooked so that often when the usual clinical signs are seen upon the scalp the disease is already far advanced.

Etiology.—Favus may be caused by any one of several types of fungus, Achorion gallinae (fowl parasite) A. quinckeanum (mouse parasite) A. gypseum and A. violaceum, but the fungus usually responsible for favus both in children and adults is the A. schoenleinii. In all these, *an animal parasite* becomes parasitic to man.

Favus is usually a disease of children, most adult cases having originated in childhood and continued untreated or improperly treated into later life. Accordingly most patients are seen between infancy and puberty Favus rarely begins in children over 15 years of age In contrast to tinea capitis, spontaneous disappearance of the favus lesions does not occur at puberty Children frequently become infected through parents or grandparents with whom they have had close contact. The history usually elicited is that a parent or grandparent in the child's home has been suffering with favus of the scalp since his childhood and has been a carrier De-

scaly (Fig. 109 *A*) When the lesions are scraped gently with fingernail or scalpel without bleeding, a fine scale is obtained. Known as the Hobelspanphänomen this finding is considered diagnostically pathognomonic The test becomes of real diagnostic importance when the lesions are poorly defined

Unusual varieties of tinea versicolor are sometimes seen guttate lesions plaques or large circumscribed areas. A rare follicular type also has been described

The areas of predilection are the anterior and posterior regions of chest and shoulders. The abdomen arms and groins less frequently be come affected the legs are seldom involved Lesions may be seen upon the face, neck fore head and even upon the chin and scalp (Fig. 109 *B*) The axillae, inframammary folds and inguinal regions are sometimes involved in adults but seldom in children Itching is either absent or mild The disorder is persistent but is devoid of any constitutional symptoms It is often discovered accidentally in routine physical examination of children. Under ultraviolet light, the patches appear golden yellow to dark brown.

Diagnosis.—The superficial scales, which are easily dislodged by scraping the macule, leave a slightly reddened base. If a few scales are placed on a warm glass slide and a few drops of a 10 per cent potassium hydroxide solution are applied with a drop of methylene blue microscopic examination discloses short, straight and angular fragments of mycelial threads, also clusters of the thick-walled, round and budding forms of spores

Differential Diagnosis.—Tinea versicolor should be differentiated from chloasma, pityriasis rosea, vitiligo and seborrheic dermatitis.

In *chloasma* there is no scaling Furthermore, it may involve the face a region of the skin but seldom affected by tinea versicolor The oval macular lesions of *pityriasis rosea* follow the lines of cleavage of the ribs. The scale is free at the center of the lesion but remains attached at the periphery Microscopic examination with a few drops of 10 per cent potassium hydroxide

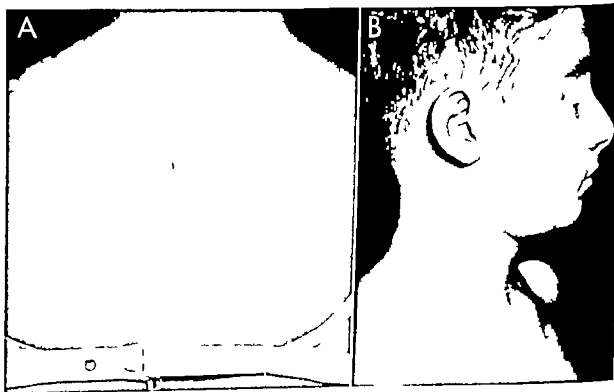


Fig. 109 —Tinea versicolor A, in a girl showing depigmented scaly macules on the usual areas of the trunk (Courtesy of The Flower and Fifth Avenue Hospitals, New York.) and B in a boy 14 years of age with typical lesions on the forehead scalp neck chest and behind the ears. The mother and a brother also were affected.

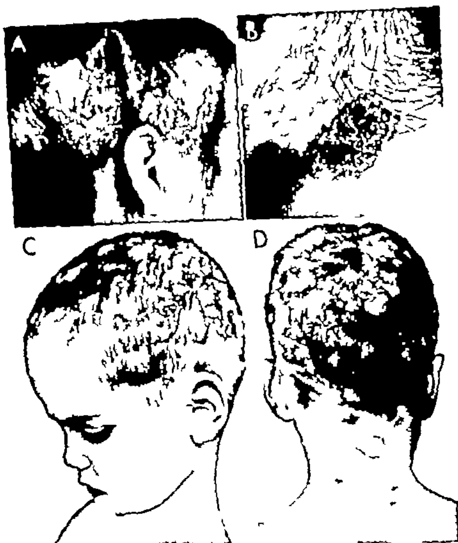


Fig. 110.—Favus. A, in girl; B, scutula along hair margin; C and D, typical crusted scutula. (A courtesy of Dr. Alfred B. Falk; B, C and D by permission from Lewis, George M., et al.: *An Introduction to Medical Mycology* [4th ed.; Chicago: The Year Book Publishers, Inc., 1958].)

include tinea capitis, the pseudopelade of Brocq, eczema, psoriasis, impetigo contagiosa and seborrheic dermatitis. *Tinea capitis* due to the Microsporum audouini and Microsporum lanosum is perhaps the most important condition with which favus is confused, particularly in its early stages. However, since both of these conditions behave similarly from a clinical point of view and their treatment is practically identical, differential diagnosis makes little difference, except prognostically. Ringworm *of the scalp* involutes at puberty while favus, if untreated, continues into adult life.

Prognosis.—The prognosis of tinea favosa is usually good provided it is diagnosed early and proper treatment is instituted, but once scarring has occurred nothing can be done for it. The prognosis for favus of the glabrous skin, also, is good; on the other hand, *favus* involving the nails is difficult to eradicate.

rect contact with infected individuals serves to transfer the infection but indirect transfer too may be accomplished by means of intimate toilet articles such as combs brushes, towels and articles of dress such as caps.

Favus happily is uncommon in the United States, although several instances have been reported among native children. However most cases are seen in immigrants particularly those from Poland Russia, Lithuania, France and Egypt. Favus is seen particularly among poorly nourished and dirty children.

Clinical Picture.—Favus is most commonly confined to the scalp although the disease also occurs upon the glabrous areas of the skin and upon the nails. Favus upon the scalp is frequently mistaken for ringworm and may be treated as such for months or even years without improvement until perhaps a microscopic examination of the infected hair and culture reveals the fungus actually etiologic to the condition.

The earliest lesions consist of localized superficial, minute, pinpoint reddish puncta that are followed by slight scaling These lesions soon develop into sulfur yellow cup-shaped, heaped crusts (Fig. 110 *C* and *D*) These crusts are peculiar in that they are hollowed out with the convexity pressing upon the epidermis and the concavity directed upward this is the so-called scutulum or cup-shaped lesion which is closely adherent (Fig. 110 *B*) Through the crusts may be found as a rule one or more dull dry dirty gray hairs several centimeters in length which occur in tufts and are more fragile than the normal hairs. Later the crusts become thick and confluent— mortarlike" masses The A. Schoenleini may be found in the scutula, the hairs and the surrounding scales. When areas of baldness are found, the disease has already existed for some time These consist of irregularly round patches of varying size, either over the vertex of the scalp or elsewhere Examination of the diseased hairs under the Wood light will disclose a yellowish-green fluorescence. When the crusts are removed, red depressed moist bases are found contrasting with ringworm hairs which break off in stumps. The entire hair follicles in favus may be easily pulled out of their follicular bed by forceps. Several such hairs may be found surrounded by a sheath which is the epidermal lining of the infected hair follicle. Eventually such hairs becoming loose, fall out and leave an area of alopecia (Fig. 110 *A*) The entire scalp may become involved with atrophy and scarring. In some patients, there is associated a peculiar musty odor suggestive of the urine of a cat or mouse.

The lesions of favus of the glabrous skin may sometimes resemble circinate ringworm or seborrheic eczema. The scutulum appears in the center of the lesion with the raised border presenting vesicles. The lesion itself may be scaly so that a clinical diagnosis of favus rather than of ringworm may be difficult from the gross appearance Although favus in the scalp may exist for years without spreading to the trunk or elsewhere it is a good rule to examine the patient for lesions of the nails and of the glabrous skin.

Favus of the nails may involve one nail or more which become brittle and lustreless. In this respect favus does not differ from other fungous infections of the nails and without a mycologic examination cannot be differentiated Some cases of favus of the eyelids have been reported.

Diagnosis.—Diagnosis is comparatively easy in typical active cases. As previously mentioned favus is the only dermatosis characterized by the occurrence of little disks (scutula) around the hair follicles In fact these scutula constitute the most important diagnostic feature. Grossly upon inspection the scutula consist of sulfur yellow masses with centrally depressed concavities through which a hair usually projects. The disks enlarge, coalesce and assume a whitish gray color They are easily dislodged by forceps when dislodged they leave a reddened moist base. Microscopic examinations of the scutulum with a few drops of 15 to 20 per cent potassium hydroxide solution will disclose the presence of spores and mycelia. The clinical diagnosis of favus should be based mainly on changes of the hair since other symptoms, erythema scaling, scutula atrophy and alopecia may be absent. In long standing cases the only sign of activity may be small areas of perifollicular redness with only occasional infected hairs there will also be numerous scarred areas showing but an occasional atrophic hair

Differential Diagnosis.—The important diseases to be considered in differential diagnosis

extensive angina. This form also involves the gastro-intestinal tract including the anus, the female genitalia and the lungs, liver and kidneys. (2) The second type is an exceedingly chronic form, with cutaneous lesions affecting the extremities, the nails, the nail bed and the trunk in isolated patches. In this type the cutaneous lesions are dry, scaly and crusted and are characterized by only slight itching except when the interdigital spaces are involved, but at no time is the inflammatory reaction of the skin severe although vesicles are observed. The most common type of moniliasis is that observed in newborn infants which involves the mucous membranes of the mouth and is known as thrush.

Etiology.—Pathogenic Candida albicans apparently plays an important part in rashes of infancy and early childhood. In a two-year study of 1447 infants with rashes, Vignec found the organism in 36.5 per cent of 361 with diaper rashes and in only 10.2 per cent of a control group of 334 with no rashes.

A most common and undoubted cause of thrush among newborn infants is the direct contamination of the mouth with the mother's vaginal discharges during or shortly after birth. This causation offers an acceptable explanation for certain sporadic cases of thrush. Plass and his co-workers found that pregnancy per se is apparently a predisposing factor since 11 of 16 pregnant women complaining of vaginal irritation showed the organisms. Presumably the increased acidity of the vaginal secretion during gestation favors the growth of the monilia. It has also been demonstrated that *monilia* obtained from the vaginas of pregnant women can produce oral thrush in newborn children.

Clinical Picture.—Oral thrush is characterized by the presence of small white flakes or larger plaques on the tongue and buccal membranes. The plaques, loosely adherent to the mucosa, upon removal leave a bright red, moist base.

Perlèche appears as fissures or cracks at the corners of the mouth. The lesions are moist and erythematous and may show several vesicles. Quite painful, they heal with difficulty because of the constant motion of the parts involved. This condition may be associated with vitamin B deficiency although each may develop independently of the other. The tongue affected by moniliasis generally shows white patches firmly attached upon the sides and under surface. In long standing cases, the tongue becomes rubbery while the papillae atrophy.

The skin manifestations of moniliasis include (1) localized lesions and (2) generalized lesions and moniliids. Since moniliasis, not unlike tinea circinata, is a superficial fungous infection of the skin, it is not surprising that in many instances the clinical manifestations closely simulate those of ringworm, particularly during the early stages. Patients may show circinate patches on the scalp and glabrous skin, including the chin, lower trunk, thighs and buttocks. These lesions strongly resemble ringworm, while the extensive eruption seen on the vulva, mons veneris, thighs, perineum and buttocks may resemble the eczema marginatum of the older writers (Fig. 111). As has already been noted, the lesions around the mouth, neck and face are frequently associated with thrush of the *oral mucous membrane*.

Similar lesions may be found upon the *external genitalia*, the genitocrural area, the *lower* abdomen and thighs, secondary to those in the *intestinal* tract. In fact, the presence of the fungus upon the buttocks and external genitalia should lead to search for monilia upon the anal mucosa. At times these lesions have been mistaken for those of diaper rash (Fig. 112). The primary lesion may be a vesicle or an erythematous macule, which spreads peripherally and clears in the center not unlike tinea circinata. On increase in size, larger scaly erythematous macules appear which assume circinate form and which by coalescence later present irregular or polycyclic figures. The intertriginous areas such as the groins, anal cleft and axillae are in the present writer's experience less frequently involved in children than in adults. When these areas are involved the lesions are moist, soggy and acutely erythematous, of a reddish-brown color or crusted, closely simulating those of seborrheic dermatitis or an impetiginized eczema. Indeed the condition, because of the inflammatory reaction and crusting, has sometimes been mistaken for impetigo contagiosa. In contrast to those of impetigo, however, the lesions fail to improve with topical therapy

Prophylaxis.—All infected members of a family should be treated simultaneously Once a diagnosis has been established an effort should be made to trace the infection by examining all members of the family and their contacts" such as playmates and fellow schoolchildren. All infected children should be kept out of school until a cure has been achieved

Treatment—In the treatment of *favus of the scalp* the scutula should first be loosened by means of improvised caps of several thicknesses of gauze soaked in 3 per cent salicylic acid dissolved in olive oil or liquid petrolatum. They should remain on the scalp for a period of 12 to 24 hours, with care being exercised to prevent the salicylicated oil from dripping into the eyes. The scalp and hair should then be thoroughly cleansed with tincture of green soap and water

The principle in favus therapy is to get rid of the fungus which penetrates into the hair follicles to the papillae. Two methods are commonly employed (1) manual epilation by means of mechanical forceps and (2) epilation by roentgen ray

From small localized infected areas, the hairs may be removed by manual epilation with a strong pair of blunt forceps. From 12 to 20 hairs may be removed at a single session. After epilation the head should then be dressed with a fungicidal ointment or a paste such as 1 3 per cent pyrogallol once daily or perhaps with one of the stronger fungicidal remedies advocated in the treatment of tinea capitis. Repeated painting of the diseased areas of the scalp with tincture of iodine has also been found effective X ray epilation is indicated for widespread infection most authorities advocate it as the best and quickest means of affecting a cure. A 5 per cent ammoniated mercury ointment in petrolatum or 25 per cent iodine crystals in goose grease should be rubbed into the scalp daily during the period of alopecia after roentgen ray therapy has been used. Generally the hair falls 14 to 18 days after roentgen ray therapy· a regrowth of hair usually follows in one month. A second epilation of the scalp may be done six to nine months later according to the same procedure if the first fails on the other hand, it is inadvisable to epilate by means of x ray more than twice, for thereupon follows the danger of complete and permanent alopecia.

Favus of the glabrous skin calls for the use of wet dressings of 2 per cent boric acid or other suitable material the use of salicylated oil to remove the crusts, which in turn is followed by a 2 or 3 per cent ammoniated mercury ointment or a 5 per cent sulfur ointment. Favus involving the nails requires evulsion of the nail followed by fractional x ray therapy Parasiticidal and fungicidal ointments should be applied with the hope of preventing a recurrence.

The patient should not be discharged as cured until there have been two examinations a month apart with negative results as determined by Wood light, by microscopic examination of the hairs and by negative culture.

Representative Prescriptions

℞
Thymol (10%) 1 0
Chloroform 120 0
Misce et fiat
Signa. Apply twice daily Shampoo scalp twice weekly To be used exclusively for three months The hairs are to be epilated manually from the infected parts under a Wood filter once eekly

℞
Chrysarobin (4%) 4 8
Chloroform 1?0 0
Misce et fiat
Signa Alternate these applications with first prescription at end of three months period. This treatment is to be continued for one year The thymol prescription is applied twice eekly during the period of hair regrowth
Indication. Active therapy

(Morris)

See Formulary ℞ 46, 47 82, for active therapy

Candidiasis
(Moniliasis)

Candidiasis is an acute, subacute or chronic infection caused by monilia a yeastlike fungus, species of Candida The Candida albicans may produce lesions in the mouth vagina, skin, nails, bronchi or lungs and occasionally may result in sepsis terminating fatally It is the only pathogenic fungus all others are saprophytic.

Schlutz has roughly classified moniliasis into two types. (1) The chronic septic form affects the buccal mucous membranes and produces

On the trunk, the lesions appear as dry isolated patches with considerable scaling and crusting. Curiously enough, there is very little, if any itching, except when the interdigital spaces are involved. Another interesting clinical feature is that the dermatosis is unaccompanied by any severe inflammatory reaction. Generally there is no elevation of temperature; which fact may account for the stubbornness of the lesions, except where pulmonary infection complicates the picture. In the extreme degree, moniliasis may be associated with hyperkeratotic lesions, and even horny protuberances.

MONILIDS (LEVURIDS) —Moniliads are symmetrically situated, grouped vesicular lesions of a sterile content occurring most commonly over the hands, extremities and trunk. Their pathogenesis is similar to that of dermatophytids, namely the deposition of the fungi and their toxins upon the skin at points secondary to the original focus by transmission through the blood stream.

Diagnosis.—Crusted localized, generalized or erythematous lesions or moist scaly plaques occurring singly or confluently should cause the pediatrician to consider the possibility of moniliasis. Since the organisms are usually seen in the fresh preparation and can be cultured without difficulty (Fig. 114) Conant *et al* suggest direct examination as the only practical way to differentiate moniliasis from the lesions caused by the common dermatophytes, seborrheic dermatitis, contact dermatitis, avitaminosis, sprue, geographic tongue and pyoderma. Suspicion becomes justifiable when the lesions fail to respond to topical therapy within a reasonable time. When the clinical picture is associated with oral or anal thrush, one is justified in assuming that the skin lesions are probably due to monilia. However confirmatory evidence of the existence of pathogenic thrush should be gathered demonstrating the presence of mycelia. This can be obtained from the scrapings of the lesions or by smears obtained from the lesions of the tongue, oral and anal mucosa and cultured on Sabouraud's medium and then on cornmeal agar

Prognosis.—Oral thrush and perlèche are generally amenable to proper mouth hygiene and local therapy Thrush involving the mucous

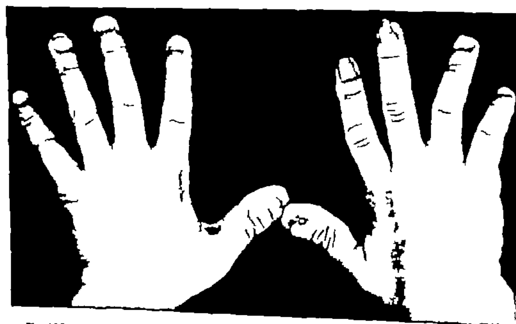


Fig. 113.—Onychomycosis (moniliasis) in a boy 9 years of age. Note the dry friable and lusterless nails, three on the right hand and the thumbnail on the left. (Courtesy of Dr Morris A. Ralf, Metropolitan City Hospital Department of Dermatology New York.)



Fig 111.—Candida albicans. *Cutaneous moniliasis of external genitalia and thighs in a child. Positive growth on cornmeal agar* Note the satellite lesions on the lower abdomen (Courtesy of Dr Meyer L Niedelman)



Fig 112.—Candida albicans. A, primary cutaneous moniliasis in an infant. The lesions were bright red with a yellowish tinge and with pronounced scaling at the periphery The plaque in this child was sharply marginated B Candida albicans infection superimposed upon infantile eczema. Note the follicular papules (which were red) characteristic of infantile eczema but not of moniliasis. (From Robinson R. C., *Cutaneous moniliasis in infants, J Pediat. 50 7 1 June 1957*)

with germicides or the usual broad spectrum antibiotics. This failure if it prompts a mycologic study may serve soon to confirm the suspicion that the lesions are caused by monilia. Nystatin and Myconef ointments have been found to give a favorable response

The lesions of moniliasis of the skin are particularly notorious for their chronicity and for *involving the extremities, particularly* the nails and nail beds (Fig. 113) Very often the entire nail area may be involved The clinical picture in children is different from that in adults, in whom the nail involvement is characterized by a painful sausage-shaped erythematous swelling around the nail. All the nails or only one or two of the hands and feet may be involved.

corticosteroids and antibiotics are now marketed. Myconef ointment and Mysteclin-V for instance contain broad spectrum antibiotic therapy and provide concomitant antifungal, anti-inflammatory and antibacterial therapy. Mysteclin-V combines the effect of broad spectrum antibiotic therapy with prophylaxis against monilial complications.

More recently Vignec has reported excellent results with Phenacridane cream (9-p-hexyloxyphenyl-10-methylacridium chloride)

The general health and resistance of the patient should be improved by a well balanced diet adequate with vitamins. Cod-liver oil should be administered to the undernourished in sufficient doses.

Thrush of the tongue and mucous membrane of the mouth responds to mild hygienic and antiseptic measures. In my opinion, one of the best local methods for treating thrush of the tongue and mouth is the use of essence of caroid, which should be applied with a cotton applicator several times daily between feeds or immediately preceding the customary bottle or breast feeding. The ferment papain contained in the caroid is more useful for dissolving the characteristic white plaques than any other means. Alkaline solutions such as borax (sodium biborate) or bicarbonate of soda are useful. Dyes, while messy and tending to discolor the mucous membrane of the mouth and the skin, have enjoyed popularity. Gentian violet (methyl rosaniline violet) generally considered a specific remedy may be prescribed as a 1 per cent or 3 per cent aqueous solution either alone or combined with other closely related dye. Berwick's dye consisting of 1 per cent gentian violet and 1 per cent brilliant green in 50 per cent alcohol may be used as a paint several times daily. For cutaneous moniliasis the newer antibiotics, ointments and creams, powders, paints and shake lotions are indicated. Silver nitrate and dilute solutions of copper sulfate are also effective remedies with some patients.

Representative Prescriptions

℞
Sodium caprylate ointment (10%) 30.0
Signa: Apply twice daily
Indication. Active therapy
(Keeney)

℞
Solution (aqueous) sodium caprylate (20%) (pH 7.4) 30.0
Signa: Swab lesions every two hours or three times daily
Indication. Active therapy
(Keeney)

See Formulary For moniliasis, ℞ 4 and 6 for acute erythematous lesions, 55 for active therapy (localized cutaneous lesions). For perlèche, ℞ 4, diluted with equal amount of distilled water and applied three times daily for active therapy; 19 for active therapy; 71 for associated pyoderma; 119 for adjuvant therapy. For onychia and paronychia, ℞ 3 and 71 for active therapy; 38 for secondary infection, 71 for active therapy.

DEEP FUNGOUS INFECTIONS

Actinomycosis

Actinomycosis is a local, malignant disease, granulomatous in nature which may be acute, subacute or chronic. It is characterized chiefly by sinuses and fistulae from which may be isolated variously colored granules, actually masses of mycelium of the genera actinomyces and nocardia. The name "actinomyces" (ray fungus) was introduced by Harz in 1878 to describe the fungous granules which Bollinger discovered in 1877 in a cow suffering with the disease known to veterinarians as "lumpy jaw."

Actinomycosis may be divided into two main groups (1) cutaneous and (2) visceral. Glover and his colleagues have suggested another classification by etiology namely that the term "actinomycosis" be restricted to infection due to A. bovis, and the term "nocardiosis" be applied to infection due to N. asteroides (Fig., 115 A).

Etiology.—The infection is worldwide. While no age is exempt, actinomycosis is comparatively rare in children. The type of fungus most commonly responsible is the Actinomycosis bovis. This fungus may be found as a normal inhabitant in the mouth of some persons but without pathologic significance. It is found especially in and about carious teeth, the folds of the gums and in the tonsillar crypts. Trauma seems to be

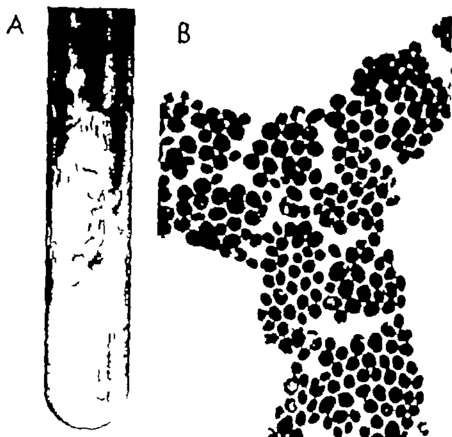


Fig. 114.—Candida albicans. A, culture of smear from moniliasis lesions on Sabouraud's agar medium. Grossly the culture resembles that of staphylococcus. Transfer of culture to cornmeal agar produced growth of pathogenic monilia. B, microscopic examination of gram-stained smear shows budding yeast cells. This is from the patient shown in Figure 113. (Courtesy of Miss Mary Damiani, Welfare Island Dispensary, New York.)

membranes of the mouth in infants is certainly curable by local measures. The cutaneous lesions are resistant to topical remedies. Chronic general sepsis, if it develops, almost invariably results fatally. The danger of thrush infection to the infant comes through its extension into the esophagus with the subsequent syndrome of refusal of feedings, vomiting and dehydration, aspiration of vomit, septicemia, intestinal spread and monilaluria.

Management and Prophylaxis.—Anderson *et al.* stress the advisability of making routine oral examination of the mouths of all newborn infants and of isolating those in which the fungus is found. Their studies show that oral thrush can be anticipated on the basis of a mycologic report declaring the presence of Candida albicans. Several clinicians have suggested that the disease may be prevented by prohibiting any contact with an infected mother during the immediate post partum period.

Treatment.—Recently a number of newer preparations of antibiotic nature derived from cultures of Streptomyces noursei have been found effective in the treatment of monilial infections. Among the more important of them is Mycostatin. Mycostatin suspension when reconstituted in 22 cc. of distilled water contains 100 000 units per cc. and apparently provides effective antibiotic therapy for thrush and other monilial infections of the mouth. It is administered in 1 cc. doses, dropped in the mouth and swallowed, four times daily. Mycostatin dusting powder is also available as specific therapy for cutaneous monilial infections. It is applied directly to the lesions two or three times daily until healing is complete. Mycostatin ointment is available for perlèche, paronychia, anal eruptions and lesions of nonintertriginous areas due to Candida albicans. It is applied four times daily until healing is complete.

Other preparations containing nystatin with

ules appear in the vicinity of the first nodule and undergo the same cycle of evolution. At first, the lesions are of a pink hue but later they become dusky red. As a result of the breaking down and the discharging of a seropurulent material of the additional secondary nodules, fistulae are produced which may become intercommunicating. Fungi then become distributed through such atria, thus initiating new foci of infection and eventually the surrounding skin appears as a granulomatous mass characterized by an oozing discharge.

The cervicofacial type of the disease (Fig. 115 B) is an example of the secondary type; a that in which the lesion begins in the buccal or pharyngeal area and pushes its way outward through the skin. This type constitutes approximately 50 per cent of all cases. Trismus is a frequent symptom when the muscles of mastication are affected.

Constitutional symptoms are at a minimum as a rule when the disease is localized.

Diagnosis.—The characteristic clinical appearance of the lesions in the cervicofacial type is comparatively easy to diagnose. In the presence of sinus formation and stiff, woody swelling, actinomycosis should always be considered. On the skin, the appearance of nodules which gradually enlarge and finally break down with a discharge of a seropurulent material should arouse suspicion of actinomycosis. Sulfur granules are found in the discharge in approximately 90 per cent of cases and this finding is diagnostic. Histopathologic examination of the diseased tissues shows the gram-positive branching filaments with round and *clubbed* ends which are non-acid fast. Blastomycosis, syphilis, tuberculous gumma, tuberculous adenitis, Hodgkin disease and lymphosarcoma must be differentiated.

Complications and Prognosis.—Actinomycosis may become generalized, pulmonary and deep abdominal cases are not uncommon. Periostitis, osteomyelitis with bone destruction or central, rarefying osteomyelitis expanding the cortex into pseudocyst in advanced cases may be seen.

Before the introduction of antibiotics and sulfonamides, actinomycosis was considered a grave disease but modern therapeutic remedies have reduced its mortality. The prognosis is best in the localized cervicofacial and skin involvement types but becomes progressively worse in the thoracic, abdominal, generalized and neurologic types.

Treatment.—Penicillin is regarded almost as a specific, results from its use being spectacular within a few days after it is administered. Dramatic results have been obtained in a few days with doses as small as 5000 units given every three hours intramuscularly for a total of 410 000 units.

Sulfonamides are also very effective in the treatment of actinomycosis, although they have been replaced largely by penicillin. Sulfadiazine is recommended as the drug of choice. Initial treatment begins with 2 Gm. every four hours, given four times daily and then 1 Gm. every four hours. The latter dose is then continued until the lesions clear up. The dose is then reduced to level of 5 to 10 mg. per cent in the blood and maintained there.

Potassium iodide may be given orally as the saturated solution, beginning with *three drops* well diluted, three times daily and *increased one drop at each succeeding dose until the point of tolerance* has been reached. When potassium iodide cannot be tolerated, sodium iodide may be substituted intravenously. The older child may receive *from 0.5 to 1 Gm.* daily.

Surgical drainage should be carried out routinely. Sinus tracts should be opened and drained. Débridement or excision of severely damaged or diseased tissue should be carried out when indicated. Roentgen ray therapy is used *to* supplement the antibiotics. Follow-up treatment after improvement has occurred by prescribing sulfadiazine in doses of 1 Gm. four times daily may consist of a reduced dose of 1 Gm. three times daily and this dose should be maintained for at least two months.

Attention should be directed to the general resistance of the patient, with prescription of a regimen to include adequate rest and a well balanced diet supplemented with vitamins.

Sporotrichosis

Sporotrichosis, chronic infection caused by the Sporotrichum schenckii, is characterized by

the most important single factor in the production of the disease. Accordingly *trauma incident* to tooth extraction or tonsillectomy may activate the fungi to cause the disease.

The fungi causing actinomycosis in man belong to two *biologic groups* The first is the anaerobic or microaerophilic type A bovis which is gram-positive and non-acid fast. It is found in approximately 90 per cent of patients with the ordinary type of actinomycosis usually referred to as "lumpy jaw It usually produces in the tissues sulfur granules composed of mycelial masses with radial club arrangement at the periphery

The second type of organism aerobic and without acid fast property *is frequently* described in the English and American literature as streptothrix and in the French and South American literature as nocardia

Clinical Pictu e—Only the cutaneous variety will be described here. The skin is affected in approximately 5 per cent of cases. The cutaneous lesions may be either primary or secondary In the primary form the lesion first appears in the epidermis as a nodule which then extends into the corium and the subcutaneous layers of the skin In the secondary form the lesion first appears as a deep-seated infection in tissues in close relation to the skin e g the buccal thoracic and abdominal cavities. Then, by gradual progression the lesions advance from within outward involving the superficial layers of the skin

In the primary form (or inoculation type) the nodule penetrates the deeper layers of the cutis enlarges and extends into the superficial region of the skin. The nodule softens, becomes fluctuant and finally ruptures, exuding a seropurulent or sanguineous material containing the so-called sulfur granules, the fungous structures characteristic of actinomycosis. Eventually the ruptured nodule is followed by scarring. On the other hand a crust may form which interferes with healing. Not uncommonly additional nod-

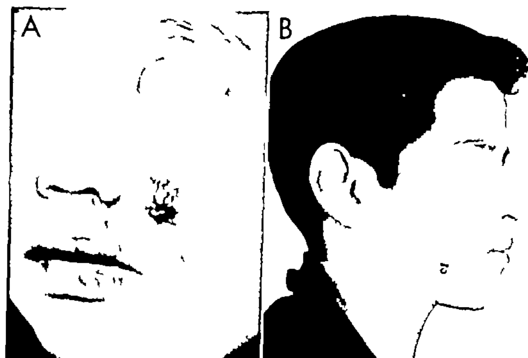


Fig 115.—A, Nocardiosis (i.e., actinomycosis due to N asteroides) in a boy 3 years of age Lesion on left cheek is a raised, indurated, erythematous nodule with several small punctate openings from which yellow purulent material could be expressed There was mild submandibular adenopathy Infection was presumably acquired from a cat. Diagnosis was confirmed by culture. B Actinomycosis. Cervicofacial type Note lesion with discharging sinus. (*A* courtesy of Captain Wm. J Beckmeyer MC, USAR, Pediatric Service Department of Medicine Valley Forge Army Hospital Pediatrics, January 1959 *B* courtesy of Dr A. González Ochoa Mexico, D.F)

ules appear in the vicinity of the first nodule and undergo the same cycle of evolution. At first, the lesions are of a pink hue but later they become dusky red. As a result of the breaking down and the discharging of a seropurulent material of the additional secondary nodules fistulae are produced which may become intercommunicating. Fungi then become distributed through such stria, thus initiating new foci of infection and eventually the surrounding skin appears as a granulomatous mass characterized by an oozing discharge.

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Before the introduction of antibiotics and sulfonamides, actinomycosis was considered a grave disease but modern therapeutic remedies have reduced its mortality The prognosis is best in the localized cervicofacial and skin involvement types but becomes progressively worse in the thoracic, abdominal, generalized and neurologic types.

Treatment.—Penicillin is regarded almost as a specific, results from its use being spectacular within a few days after it is administered. Dramatic results have been obtained in a few days with doses as small as 5000 units given every three hours intramuscularly for a total of 410,000 units.

Sulfonamides are also very effective in the treatment of actinomycosis, although they have been replaced largely by penicillin. Sulfadiazine is recommended as the drug of choice. Initial treatment begins with ½ Gm. every four hours, given four times daily and then 1 Gm. every four hours. The latter dose is then continued until the lesions clear up. The dose is then reduced to a level of 5 to 10 mg. per cent in the blood and maintained there.

Potassium iodide may be given orally as the saturated solution, beginning with three drops well diluted, three times daily and increased one drop at each succeeding dose until the point of tolerance has been reached. When potassium iodide cannot be tolerated, sodium iodide may be substituted intravenously The older child may receive from 0.5 to 1 Gm. daily

Surgical drainage should be carried out routinely Sinus tracts should be opened and drained. Débridement or excision of severely damaged or diseased tissue should be carried out when indicated. Roentgen ray therapy is used to supplement the antibiotics. Follow-up treatment after improvement has occurred by prescribing sulfadiazine in doses of 1 Gm. four times daily may consist of a reduced dose of 1 Gm. three times daily and this dose should be maintained for at least two months

Attention should be directed to the general resistance of the patient, with prescription of a regimen to include adequate rest and a well balanced diet supplemented with vitamins.

Sporotrichosis

Sporotrichosis, a chronic infection caused by the Sporotrichum schenckii, is characterized by



Fig 116—Sporotrichosis, regional lymphatic type. In **A** note the subcutaneous granuloma with lceration localized to the left side of the face. In **B** note the granulomatous lesions on the right side of ie face. In **C** note the granulomatous lesions in linear distribution on eyelids and cheek (*A* courtesy f Dr Roberto Nunez Andrade, Mexico D F *B* courtesy of Dr A González Ochoa, Mexico D F : by permission from Lewis, George M *et al* *An I troduction to Medical Mycology* [4th ed Chicago he Year Book Publishers, Inc 1958].)

the development in the lymph nodes, skin or subcutaneous tissues of nodular lesions, which may soften and break down to form indolent ulcers.

Case reports have appeared from all countries. In the United States most cases have been reported in the midwest, west and northwest regions, although isolated cases have appeared in other states. The disease is common in France. Also it is more common in animals than in man. Animals may act as mechanical carriers. Also, carnations infected with a species of sporotrichum not pathogenic for animals, and the thorns of barberry shrubs, have been known to transmit the disease to human beings. Sporotrichum has been found in all parts of the world, usually as saprophyte in flowers, grains, grasses, bark, thorns and vegetables, but also on fleas, ants and various forms of insects. It seems likely that the fungus invades the human body through minor wounds on the skin, especially of the fingers, hands and feet, which are the commonest sites of involvement.

Clinical Picture.—There are *two* common types. I the United States the lymphatic type is usually encountered in France the systemic type is more common.

Th localized lymphatic form is characterized by the formation of indolent cutaneous and subcutaneous granulomatous lesions (Fig. 116). The initial lesion is characterized by chancre like ulcer (sporotrichotic chancre) which may appear anywhere on the extremities but is usually seen on a finger hand or foot. Three weeks to three months later a series of nodules is seen to occur in an ascending fashion along the course of the lymphatics draining the initial lesion. Upon examination the nodules of this chain are found to be quite firm discrete and painless. Later they may become adherent to the overlying skin, with the skin assuming a reddish color. Then they may undergo ulceration and secondary infection. When ulceration occurs, the floor of the ulcer is granular bleeds easily and becomes covered by crust. Sinuses may or may not communicate with the lesions.

The fungus is of low virulence. Accordingly the patient is usually asymptomatic and afebrile. However in acute cases there may be *fever chills* and signs of septicemia. In chronic cases, anemia, loss of weight and strength with general debility may follow

The disseminated form usually seen in France has an insidious onset. Subcutaneous nodules may be the first obvious sign and these, scattered over the body gradually grow larger. Upon incision, the nodules yield a thin viscid pus which later becomes thick and purulent. The patients are acutely ill and frequently develop a cachectic state after weeks or months.

Diagnosis.—Conant *et* al. remarked that sporotrichosis presents, as a rule, such a characteristic picture that the diagnosis can be established by the clinical findings alone. They state that the primary lymphatic form is so characteristic in its evolution that the diagnosis is obvious. Clinically a past history of a primary infection (wound) followed by multiple cutaneous and subcutaneous nodules in a chainlike pattern, ulcers of the indolent type and nodules which are at first discrete, firm, and later soft and breaking down and discharging a characteristic viscid, grayish-yellow pus compose a picture which is unmistakable. As a rule the patient's health remains unimpaired. For absolute diagnosis, culture of the aspirated material from lymph node, or the pus and animal inoculation will settle diagnosis. The sporotrichum test is *helpful* in doubtful cases.

Prognosis.—Prompt improvement and rapid recovery is the rule after one or two months of the proper therapy

Treatment.—Potassium iodide is the drug of choice. A saturated solution of potassium iodide should be started as soon as diagnosis has been reached. The child of school age should receive three drops well diluted by mouth, three *times* daily and this dosage should be increased by one drop at each succeeding dose t i d. daily *until* tolerance has been reached. The drug should then be tapered off but continued for another four to six weeks after complete recovery. Iodine may also be used locally. Open lesions should be flushed and compressed and large abscesses should be aspirated and flushed with Lugol's solution (Strong Iodine Solution U.S.P.)

Roentgen therapy has been used as an adjuvant to the iodide treatment.

Representative Prescriptions

℞
Potassium Iodide (saturated solution) 60.0
Signa Three drops well diluted with milk t.i.d. Increase by one drop t.i.d. each succeeding day until tolerance has been reached. The dose should then be reduced

℞
Strong Iodine Solution U.S.P 1000 cc.
Signa. To be used as an irrigating fluid for abscesses or as a wet dressing for ulcers

Blastomycosis

(Gilchrist's Disease)

Blastomycosis is a chronic infection caused by *Blastomyces dermatitidis. It is* character ized by the formation of suppurative and gran-*ulomatous lesions in any part of the body but* with a predilection for the skin, lungs and bones *The two clinical types are (1) systemic (dissem* inated) blastomycosis and (2) cutaneous blasto-*mycosis. The cutaneous form generally local-* ized on the skin and in the subcutaneous tissues *rarely spreads to other organs. This cutaneous* form will be the only type described.

Etiology—The *causative organism is the* Blastomyces dermatitidis No age is exempt. *Apparently it affects females more often than* males and it is more common among the poor All cases reported appear to have occurred in the United States. A few seeming cases have also been reported in Canada and England, but the diagnosis of the North American type of blastomycosis has not been confirmed. The source of the infection is exogenous. The disease is not contagious but instances have been reported in which the infection has been ac quired by direct inoculation or by prolonged contact with an infected person

Clinical Picture—The initial lesion consists of a papule or a papulo-pustule. It is usually seen on the face, hands wrists, feet or ankles (exposed areas) Soon the lesion breaks down and is followed by the discharge of a purulent or sanguino-purulent exudate which if exam ined under the microscope, will be found to show the *Blastomyces* dermatitidis. *Most fre* quently the lesion tends to become crusted over *it extends peripherally as it enlarges and* assumes a verrucous appearance the enlarged plaque *often following a serpiginous or* acri form pattern. The lesions may bleed when touched. An important feature is to be seen along the margin of the lesion where *it is* papilliform or verrucous in character It is this delicate, sharp papilliform appearance which serves to identify the fungous infection. After a while the center of the lesion undergoes spontaneous healing, evidenced by the formation of a soft scar Another clue to diagnosis is the purplish red border of the lesion, which stands out sharply and slopes abruptly from the elevated verrucous surface into the adjoining normal skin Upon close inspection (sometimes requiring the aid of a hand lens) a series of minute abscesses, few or many may be seen covering the border of the lesion. When these are ruptured a small amount of mucous or mucoid material is discharged which, upon culture will show the typical fungus. The lesions enlarge slowly with periods of activity and quiescence and may finally reach the size of a quarter of a dollar or even of the palm. Then, under favorable circumstances the lesion flattens out, the papillary projections disappear the secretion diminishes and the entire plaque becomes transformed into a soft pliable scar without too much deformity although long after healing has occurred miliary abscesses may still be seen.

Constitutional symptoms vary Pain may be slight or absent but is usually present *in* connection with secondary infection.

Diagnosis.—The diagnosis is based *on the* signs described, particularly the presence of miliary abscesses (pustules) *along the advanc* ing smooth border of the lesion. However a positive *diagnosis depends on demonstration of* the organism. Presumptive evidence of the pres*ence of the disease includes a positive reaction* to skin test with the Blastomyces vaccine or *positive results from the* complement fixation test.

Differential Diagnosis.—*Verrucous tuberculosis* may closely simulate blastomycosis but the *verruca in the latter* are finer the lesions do not slope downward at the margins and there are none of the minute (miliary) abscesses of the former In *dermatitis medicamentosa* from iodides or bromides the lesions of a verrucous character are usually limited to the legs. A history of syphilis will be found in nodular ul-

cerative *syphilids*. *Epithelioma* and *granuloma inguinale* are rare in childhood. When differentiation from any of these conditions is difficult by clinical means, histopathologic examination of diseased tissue, blood serologic tests and other appropriate laboratory studies will settle the question.

Treatment.—Early lesions are best treated by excision or by electrodesiccation. Crusts and scales should be carefully débrided with a warm physiologic saline solution in the form of wet dressings. These dressings are also helpful for any secondary infection.

Excellent improvement has followed the use of two of the aromatic diamidines, stilbamidine and propramidine, in the treatment of a patient suffering from advanced North American blastomycosis. The antibiotics may be necessary for secondary infection. Desensitization and iodide therapy by mouth or intravenously are helpful.

Histoplasmosis

(Darling's Disease)

Histoplasmosis is an acute, subacute or chronic infectious disease caused by the fungus Histoplasma capsulatum. There are two clinical forms (1) primary and (2) disseminated, which may be further subdivided, the former into active primary and healed primary the latter into acute and disseminated forms.

Etiology.—About 30 per cent of observed cases have occurred in the pediatric age group. The Histoplasma capsulatum is presumably widely distributed in moist areas, keeping over long periods of time and it may exist in any infected soil. Accordingly it is not surprising that the most common form of clinical histoplasmosis is the pulmonary type associated with the inhalation of contaminated dust materials. On the other hand, it is believed that the most common site of infection in children is the intestinal tract.

The central part of the United States, especially Michigan, seems to be an endemic focus for this disease. Other areas affected include Missouri, southern Illinois, Indiana, Tennessee, Ohio and northern Arkansas. The portal of entry while not definitely settled, appears to be most frequently the mouth. The incubation period varies from one to two weeks.

Clinical Picture.—Ulcerations and fissures may be the outstanding features. Involvement of those mucosal surfaces directly adjacent to the skin has occurred. The lesions may be granulomatous, ulcerative and painful. On the other hand, nodular lesions may occur and these may be tender. Hemorrhagic patches or crusts of various sizes have been noted.

In children the onset is usually insidious with gradual development of fever digestive disturbances, diarrhea and loss of weight. Progressive enlargement of the liver and spleen develop accompanied by anemia and leukopenia. The external lymph nodes are usually palpable but marked lymph node enlargement is not seen in children in contrast to the extensive lymphadenopathy sometimes occurring in adults.

Diagnosis.—The predominant lesion is an ulcerative granuloma which is usually covered with a crust. It is often painful, but it has little induration or peripheral inflammation. In the acute case fever splenomegaly hepatomegaly secondary anemia with leukopenia and progressive loss of weight are usually suggestive. Calcified lesions in the lungs may be found by roentgen studies, but these are not specific. A skin test with histoplasmin using 0 1 cc. of a 1 1000 solution is useful A positive reaction, indicated by induration or edema of 0.5 cm. or more after 48 to 72 hours, is suggestive diagnostic evidence of infection. A complement fixation test and smears of the blood, bone marrow and stool also are helpful. In addition, the fungus may be cultured from the bone marrow sputum and exudate, and biopsy from the skin, lymph nodes, liver bone marrow will reveal its presence. Final identification can be made by injection of guinea pigs intraperitoneally with a saline suspension of the yeast or a filamentous phase of the fungus recovered from the reticulo-endothelial cells of the liver or spleen.

Histoplasmosis should be differentiated from sarcoidosis, coccidioidal granuloma, blastomycosis, tuberculosis cutis, gumma, granuloma inguinale and syphilitic chancre.

Complications and Prognosis.—Involvement of the central nervous system in cases of generalized histoplasmosis is relatively infrequent, oc

curring only in perhaps 12 per cent of cases. Pulmonary involvement is characterized by the presence of numerous discrete pulmonary infiltrations which may simulate miliary tuberculosis on roentgenographic examination.

Histoplasmosis must be regarded as a serious disease in children. Young children rarely live more than several weeks after onset of the infection

Treatment.—Ethyl vanillate is the remedy of choice. Infants without diarrhea should receive *1.5 Gm./kg.* per day divided into four to six doses. This dosage usually provides blood levels of 20 to 30 mg./100 cc. The initial dose should be 0.5 Gm. every five to six days until a dosage of 1.5 Gm./kg. per day or the desired blood level is attained. Toxic manifestations may include sudaminous rashes fever respiratory alkalosis and hyperpnea.

Acute Coccidioidomycosis

("Valley Fever" "Bumps")

Acute coccidioidomycosis is a fungous disease and is usually characterized by the symptoms of an upper respiratory infection followed by erythema nodosum or erythema multiforme. It may be classified as (1) primary (or acute) and (2) granulomatous (or disseminated) The causative agent is the Coccidioides immitis, a fungus which occurs in two forms or cycles the vegetative form presumably found in nature and in culture, and the parasitic form, found in infected tissues. The acute form of the disease is common among children. No age is exempt cases have been reported in infants.

In a study reported by Faber and his co-workers, in every instance there was heavy exposure to dust. Accordingly it is believed that the disease is probably spread by dust contaminated with chlamydospores, which are inhaled. The disease is endemic in the southwestern part of the United States, particularly in the San Joaquin valley hence the name San Joaquin Valley fever It is also prevalent in Arizona Texas and New Mexico and has been seen also in other states, including North Carolina and Massachusetts. Cases have been reported in which the disease was acquired in the laboratory

Clinical Picture.—The skin manifestations in acute coccidioidomycosis are essentially those of erythema nodosum or erythema multiforme. However they belong to the "spectacular" second stage and develop only after an interval following *the first or the initial stage.*

Erythema nodosum lesions, while not absolutely necessary for a diagnosis, are usually a constant finding. The lesions as a rule appear on the anterior tibial surfaces and are generally symmetrical. Sometimes erythema nodosum appears on the lower anterior surfaces of the thighs occasionally on the lateral surfaces of the hips thighs or legs or on the buttocks, less frequently on the extensor surfaces of the arms, forearms and elbows. The lesions in erythema nodosum generally involute in from one to three weeks but may recur reappearing in crops with a low-grade fever Signs of acute arthritis with pain in the ankles, knees, wrists or shoulders may appear at the same time the erythema nodosum recurs.

The erythema multiforme rash of acute coccidioidomycosis may be either generalized or localized and may occur on the trunk, extremities, cheeks or neck. It is often accompanied by a hyperemia of the conjunctivae. However the so-called "second stage" may be entirely absent since subclinical forms of the disease in which the skin manifestations are entirely absent are now recognized. Proof that the disease either is or once was present is revealed by a positive reaction to a coccidioidin skin test. The positive skin reaction also has been found in apparently healthy individuals who never have shown signs of erythema nodosum or other skin manifestations of the disease A fine, macular generalized rash may appear within the first few days of onset, resembling measles, scarlet fever or a drug eruption. The onset of the acute primary infection is characterized by symptoms which resemble a systemic infection, e.g., influenza with both upper and lower respiratory symptoms. Accordingly since there is nothing particularly diagnostic at this time, it is not surprising that diagnoses such as influenza, pleurisy or occasionally bronchopneumonia have been made. However after an interval during which time the patient feels well, the skin manifestations appear usually in the form of erythema nodosum and sometimes of arthritis

and conjunctivitis, and cause the patient to seek medical advice. There are variations in the first stage. In some patients there are only slight symptoms resembling a mild upper respiratory infection while in others the signs and symptoms of the initial stage may be moderate or severe.

The onset is usually sudden with a dry cough, moderate fever and occasionally a chill. Among Faber's patients, about one half complained of generalized aching, sore throat, headache and loss of appetite. More than one third of the patients complained of pain in the chest, either unilateral or substernal, which was worsened by deep breathing, thus demonstrating a pleural origin. These initial symptoms subsided in one week but occasionally were more persistent.

The granulomatous (Fig. 117) or disseminated type (coccidioidal granuloma) is a chronic progressive disease affecting any or several organs, including the skin, and with a mortality of about 50 per cent.

Diagnosis.—The first thing to look for is a history of possible exposure, e.g., residence in or visits to an endemic area. An acute episode of respiratory disease is not uncommonly followed in two or three weeks by erythema nodosum, erythema multiforme or both. The finding of the fungus, *Coccidioides immitis*, constitutes absolute proof. Usually the disease appears 10 to 20 days after exposure and is initiated by a respiratory symptom, cough, fever and sometimes pleuritic pains. A positive diagnosis depends on positive reaction to the coccidioidin skin test or by finding the fungus on culture from sputum or gastric washings, or both. The coccidioidin skin test consists in the intracutaneous injection of 0.1 cc. of 1:1,000 solution of coccidioidin (0.1 mg.). The reaction begins to appear in about 12 hours, is well marked in 24 hours and reaches its maximum of size and intensity in about 48 hours. Smith of Stanford has shown that the test becomes positive very early in a high percentage of cases, 80 per cent being positive in the first week and 100 per cent within the third week of the disease.

Typical double-contoured spherules, with or without endospores, can sometimes be demonstrated in fresh sputum preparations and these provide valuable clue although they cannot be accepted as conclusive diagnostic evidence without confirmation by culture and animal inoculation.

Other laboratory tests which may be helpful include examination of the blood for eosinophilia and x-ray of the chest. Dickson and Gifford observed a moderate eosinophilia during the period of erythema nodosum. The percentage of positive precipitin reaction rises rapidly in the third week and then falls off. By the fourth week complement fixation is demonstrated in a high percentage of cases. X-ray of the chest may show fuzzy densities at the lung roots extending to the periphery of the lungs and resembling those of bronchopneumonia.

Differential Diagnosis.—From a pediatric viewpoint, scarlet fever and measles may cause confusion, particularly when the disease is characterized by toxic erythema or when sore throat and constitutional symptoms are present.

Complications and Prognosis.—Pleurisy with effusion may occur during the initial stage but is uncommon. The primary infection may result in a pneumonitis or bronchopneumonia. Hemoptysis is rare.

The prognosis is good. Once the febrile period is passed, recovery is the rule. This prognosis is in direct contrast to that for coccidioidal granuloma for which the prognosis is poor. In cases of coccidioidomycosis complicated by tuberculosis it is believed that the prognosis is also moderately good, provided that the coccidioidomycosis is not severely disseminated.

Treatment.—Rest during the acute febrile period should be the rule. Once the elevated temperature has returned to normal, restriction of activity such as is carried out in tuberculosis is not necessarily indicated. Children with the disease may be permitted to indulge in play and outdoor activities provided that the chest films become clear, the temperature subsides and the sedimentation rate returns to normal.

There are no specific remedies. Antibiotics, sulfonamides and iodides are ineffective. Treatment is symptomatic. Acetylsalicylic acid (0.065 Gm. for each year of the child's age until 0.32 Gm. has been reached at a single dose) may be prescribed for the muscular aches and headaches. Camphorated tincture of opium (paregoric) in doses of 0.3 cc. to 2 cc. may be

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lesions on the extremities or close to the body openings together with loss of hair and gastro-intestinal disturbances. The disease was first named by Danbolt.

Dillaha *et al.*, reporting 20 cases, found that the disease begins at between 3 weeks and 18 months of age. Danbolt and Brandt felt that the disease was the result of a deficiency of some unknown food element found in breast milk. The primary focus of the disease apparently lies in the gastro-intestinal tract. With regard to the responsible etiologic factor Dillaha writes as follows "The monilia in our patients was shown to be Candida albicans as demonstrated by growth on cornmeal agar It is my opinion and that of others who have studied cases of acrodermatitis that Candida albicans is a secondary invader and is not the etiologic factor In our patient, I believe we conclusively demonstrated that once the lesions were free of Candida albicans, new lesions easily developed in their absence. Scandinavian authors reporting on this disease have never been able to isolate Candida albicans nor any other yeast from their cases.

Clinical Picture.—The onset, usually insidious, is characterized by a small localized skin eruption in close proximity to one of the body orifices or else upon an extremity Generally accompanying the onset of the eruption or soon thereafter there occurs loss of hair and gastro-intestinal disturbance—often diarrhea. These signs, i.e. skin eruption, hair loss and gastro-intestinal disturbance, occur with such frequency as to constitute a syndrome which, according to Dillaha and his colleagues, runs a characteristically intermittent yet progressive course. Spontaneous partial remissions are followed by increasingly more severe exacerbations, frequently ending in death. The primary skin lesions, vesicobullous, appearing in successive groups or crops, are distributed symmetrically around the body orifices, eyes, occiput, elbows and knees, on the dorsal and palmar surfaces of the hands, the dorsal and plantar surfaces of the feet and especially between the fingers and toes and around the nails (Fig. 118 *A*) As a rule the trunk is free of lesions. The vesicles and bullae (Fig. 118 *B C D*) may be clear or cloudy and frequently are "flat topped. When these begin to dry up within a few days to a week, they become crusted and are followed by lamellar scaling. Finally the scales disappearing, the lesion margins may still show evidence of adherent scales, or central scaling (resembling psoriasis) may be seen. Erythematous patches may remain for many months marking the sites of the involuted lesions. Various stages in the cycle of lesion development ranging from vesicle and bulla to the final healed stages may be seen together from time to time. Interesting is the fact that new crops of skin lesions are frequently associated with upper respiratory infections. When fresh crops appear there is also an exaggeration of the hair loss and diarrhea, suggesting that there is some close relationship in the syndrome which is perhaps activated as a whole. The mucous membranes of the mouth and tongue often show a white coating. Another characteristic feature is the position of the patient's head which is held at an angle with the face downward, and with an apathetic facial expression. This is especially noticeable when the disease is active.

Diagnosis.—The syndrome (i.e., the eruption on the extremities or near the body orifices, with alopecia and gastro-intestinal disturbance [diarrhea]) is so characteristic of the disease that, as Dillaha *et al* point out, a diagnosis can be reached easily from a photograph alone. The fact that the disease occurs in very young infants also is of diagnostic assistance.

Differential Diagnosis.—Epidermolysis bullosa, generalized moniliasis, and psoriasis must be differentiated. Many of the cases reported in the literature as atypical epidermolysis bullosa or as generalized moniliasis are now known to have been acrodermatitis enteropathica. In *epidermolysis bullosa* the vesicles and bullae, appearing during early life, follow trauma of the skin and consequently are found most commonly on those prominent regions subject to trauma namely the joints, elbows, knees and feet. *Generalized (systemic) moniliasis* differs from acrodermatitis enteropathica in that a culture from the lesions always yields yeast or gamma, also its lesions are characteristically visceral. Its course is intermittent and not progressive as in acrodermatitis enteropathica

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Personal communication.

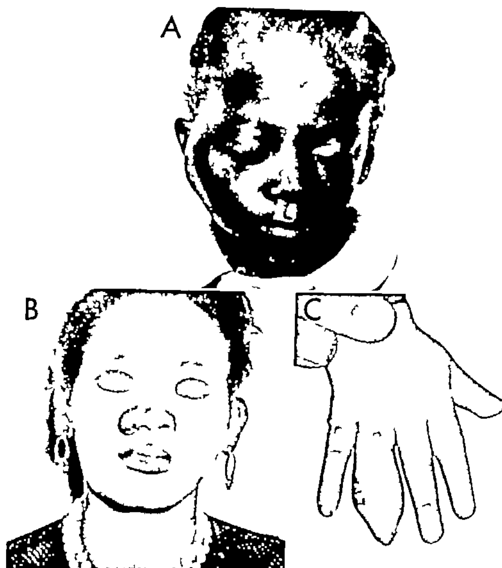


Fig 117—Coccidioidomycosis. A, in a girl 5 years of age who, seven years later was doing well. Swelling in the region of the eye was of one week's duration. Infiltrations of the lungs also were present. Spherules were seen on wet mount from drainage. Coccidioidin skin test produced positive results. Mantoux test, negative results. B in a girl 13 years of age who expired 115 days after becoming ill. Note the large granuloma of the nose X ray showed multiple osteomyelitic lesions of the hips. Coccidioidin and Mantoux tests both gave negative results. C in an infant 6 months of age. The ring finger was swollen one week after birth. A spina ventosa with spherules of coccidioides was recovered. The entire bone was osteolytic. Coccidioidin test produced plus-minus results Mantoux test, negative results. The finger was amputated. X-ray of chest had shown small cavity which five years later was healed. (Courtesy of Dr Robert Cohen, Kern General Hospital Bakersfield, California)

administered for the bronchitis, the dose depending on the age of the child.

Wet dressings of aluminum acetate solution (Burow's solution 1 10 or 1 20 dilution) may be used for erythema nodosum These wet dressings may be repeated at hourly intervals. When coccidioidomycosis is complicated by tuberculosis, the tuberculous aspect should have the benefit of streptomycin if the patient does not appear to be improved as judged by serial x rays after four to six weeks.

Acrodermatitis Enteropathica

Acrodermatitis enteropathica is a disease occurring in young infants and characterized by

Psoriasis may be mistaken for acrodermatitis enteropathica because of the adherent scale seen in the center of the lesions. However psoriasis is uncommon under the age of 5 years and removal of the heaped-up mother-of-pearl scales reveals bleeding points.

Complications and Prognosis.—Involvement of the skin around the nails, dystrophy of the nails and loss of the nails have occurred frequently. Retarded body growth and "schizoid" features—introversion, peevishness and fretfulness—have also been reported. Secondary infection (pyoderma) and monilial infection of the skin are common. The disease is accompanied by a high mortality although it is frequently associated with remissions of varying length, but these are usually of short duration.

Treatment.—There are no known preventive measures. Dillaha obtained excellent results with diiodohydroxyquin U.S.P. (Diodoquin) N.N.D. in doses of 210 mg. q.i.d. given to a 2½-year-old infant in whom at the age of five months a rapid and total alopecia appeared. Rapid resolution of all skin lesions followed within four days after the drug was started and with continued therapy full regrowth of the hair appeared. Therapy was discontinued after 16 weeks and the patient remained entirely well. Baird reported partial recovery on two occasions from the internal use of thymol.

TOPICAL THERAPY.—Painting the lesions with antimonilial remedies caused the lesions to disappear but did not prevent new vesicles from appearing. For this same purpose, also, a 1.5 per cent aqueous solution of gentian violet (methylrosaniline violet) may be tried.

See Formulary ℞ 19 and 71 antimonilial 47 for secondary infection.

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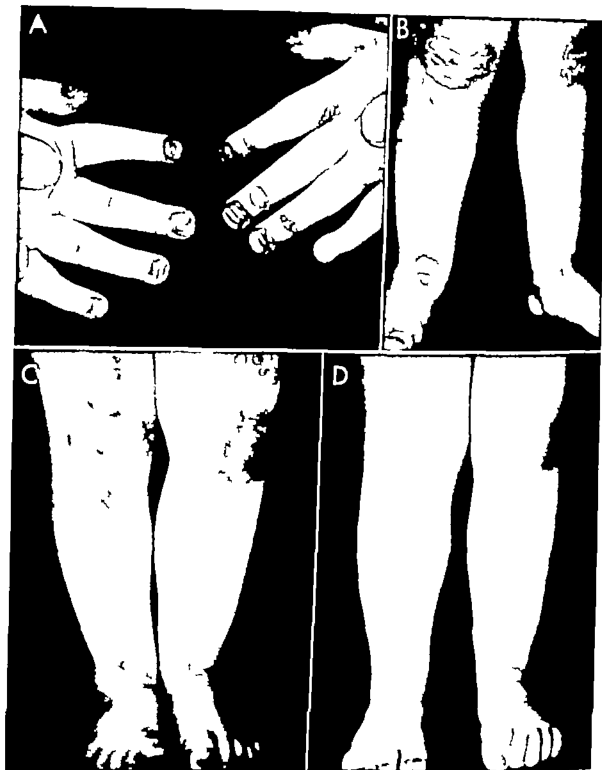


Fig 118.—Acrodermatitis enteropathica. A, dystrophic nail changes associated with paronychial skin involvement. B vesicular and erythematous lesions of knees and ankles at the time of initiation of diiodohydroxyquinoline therapy C, resolution of vesicular lesions in same patient after one week's therapy D only slight erythema remains one week after therapy (By permission from Dillaha, C. J and Lorincz, A L. J A M A 152 509-512, June 6 1953)

Psoriasis may be mistaken for acrodermatitis enteropathica because of the adherent scale seen in the center of the lesions. However psoriasis is uncommon under the age of 5 years and removal of the heaped-up mother-of-pearl scales reveals bleeding points.

Complications and Prognosis.—Involvement of the skin around the nails, dystrophy of the nails and loss of the nails have occurred frequently. Retarded body growth and "schizoid" features—introversion, peevishness and fretfulness—have also been reported. Secondary infection (pyoderma) and monilial infection of the skin are common. The disease is accompanied by a high mortality although it is frequently associated with remissions of varying length, but these are usually of short duration.

Treatment.—There are no known preventive measures. Dillaha obtained excellent results with diiodohydroxyquin U.S.P. (Diodoquin) N.N.D. in doses of 210 mg. q.i.d. given to a 2½-year-old infant in whom at the age of five months a rapid and total alopecia appeared. Rapid resolution of all skin lesions followed within four days after the drug was started and with continued therapy full regrowth of the hair appeared. Therapy was discontinued after 16 weeks and the patient remained entirely well. Baird reported partial recovery on two occasions from the internal use of thymol.

TOPICAL THERAPY.—Painting the lesions with antimonilial remedies caused the lesions to disappear but did not prevent new vesicles from appearing. For this same purpose, also, a 1.5 per cent aqueous solution of gentian violet (methylrosaniline violet) may be tried.

See Formulary ℞ 19 and 71 antimonilial 47 for secondary infection.

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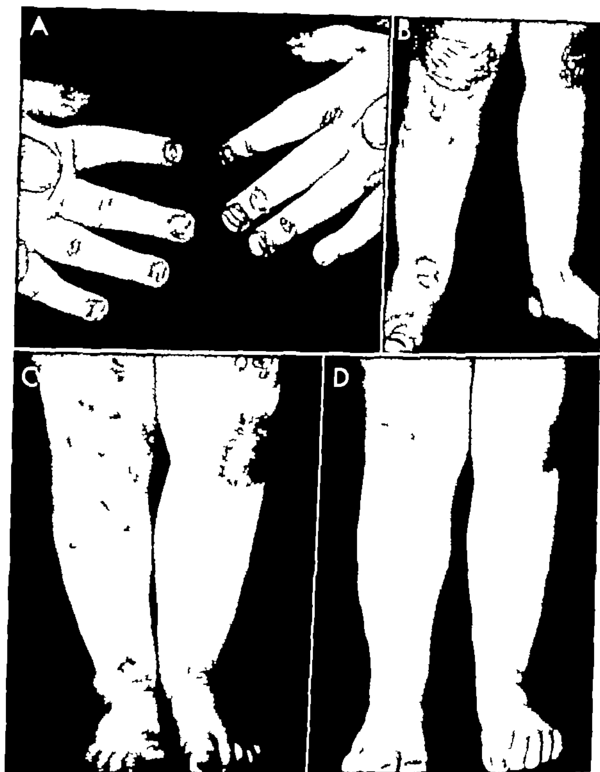


Fig. 118.—Acrodermatitis enteropathica. A, dystrophic nail changes associated with paronychial skin involvement. B, vesicular and erythematous lesions of knees and ankles at the time of initiation of diiodohydroxyquinoline therapy. C, resolution of vesicular lesions in same patient after one week's therapy. D, only slight erythema remains one week after therapy. (By permission from Dillaha, C. J. and Lorincz, A. L.: J.A.M.A. 152:509-512, June 6, 1953.)

of emergence of the hair from the scalp and are glued to the hair shaft by a powerful chitinous substance. Since the hair grows approximately ½ inch a month, one can calculate the approximate time the ova were laid by measuring the length of the hair at the site of the ova.

The eggs are hatched within six days, followed by three larval molts before maturity

(corporis) look alike, but the head louse is only one half to one fourth the size of the latter. In all types, the males are fewer and smaller than the female. The pubic louse is distinguished by enormous claws not unlike those of crabs hence the term crab louse.

The puncture of the pediculus corporis produces urticarial lesions and pigmentation in long



Fig. 119.—Pediculosis capitis of many weeks' duration in girl 8 years of age. Note the ova attached to the hairs and the excoriation of the posterior area of the neck due to scratching. Post-auricular and posterior cervical lymph nodes were enlarged.

There is no pupal stage. The complete developmental cycle is 16 days and the average life of the louse is one month. The larvae must have food to survive. If well fed, the louse can live as long as 10 days without food while separated from its host. Each female louse is capable of laying from 50 to 150 eggs. It has been estimated that each louse may give rise to 8000 descendants.

The head louse (capitis) and the body louse

standing cases. Its ova are deposited in the seams of clothing and on the lanugo hairs.

Each variety of louse has its own habitat and usually remains localized. Occasionally the pediculus migrates—from the axillae to the eyebrows, or from the pubic region to the trunk or eyelashes—but this removal is the exception.

Because pediculosis corporis and pediculosis pubis are practically never seen in children, only pediculosis capitis will be discussed here.

20

The Zoonoses

MOST OF THE zoonoses affecting humans are caused by the Arachnida (spider) and Insecta (insect) classes of arthropods. Some arthropods live habitually on the surface of the skin others burrow beneath it still others live elsewhere but attack the skin either out of hunger or in self defense. They can attack the skin in four different ways (1) By biting inserting a sucker into the skin follicles and drawing blood from the superficial capillaries and at the same time injecting a poisonous salivary fluid into the follicle in order to make the blood flow more freely (2) by stinging, like the wasps (3) by "nettling, like the brown-tailed moth of New England and causing an urticaria (4) by vesicating like certain beetles. Some like the *Anopheles* mosquito are extremely important as vectors of diseases others like the bedbug are relatively harmless in this respect

Bites and stings cause cutaneous lesions varying from slight to severe erythema and accompanied by papules wheals ecchymoses and in some instances ecchymomas as large as a goose egg. In infants, vesicles and vesicobullous lesions are common. Scratching induced by the pruritus or sometimes by the bite or sting itself often leads to impetigo contagiosa the edema reaching an enormous proportion.

Individual susceptibility and reaction to bites vary widely Some people apparently are let alone while others in their company are bitten moderately or severely some suffer only minor discomfort while others sustain more severe and sometimes systemic reactions.

The best preventive of insect bites is avoidance. However accidental bites are incurred both indoors and outdoors. For the home. proper screening and the use of netting, especially for cribs and beds, frequently minimize the possibility of bites. The use of repellents and sprays containing 25 per cent DDT is serviceable to destroy both the insects and their larvae Among the more popular repellents are Sta-Way (a complex ether) 6-2 2 and 6-12. The essential oils such as citronella, are excellent repellents. Beechwood creosote is one of the best repellents against spiders Dusting powders containing precipitated sulfur alone or in combination with talc, are useful for destroying insects on clothes, blankets, etc. A small improvised *bag containing camphor or pyrethrum worn* next to the skin is at times helpful in keeping insects away Mosquito bites on the ankles can be minimized or prevented by the wearing of two pairs of white socks. Thiamine chloride in *dose of 10 to 20 mg. daily per os is worth a trial.*

Pediculosis

(Phthiriasis)

The term pediculosis is derived from the Latin word pediculus meaning louse Three varieties of pediculosis are seen in human beings pediculosis capitis pediculosis corporis and pediculosis pubis.

The pediculus is an extremely prolific parasite Its ova, or nits, which appear as oval, whitish or grayish bodies, are laid at the point



Fig. 120.—Eczematized dermatitis secondary to pediculosis capitis, in girl 8 years of age. Note the numerous scratch marks, hemorrhagic crusts and scales. (Courtesy of Dr Irwin I. Lubowe New York Medical College, Metropolitan Hospital Center)

place for several hours. The scalp is then washed with soap and hot water

EDDY'S FORMULAS

℞

Benzyl benzoate	68 parts
Tween 80 (polyoxyalkylene ether of sorbitan monooleate)	14 parts
Ethyl p-aminobenzoate (benzocaine)	12 parts
DDT (1-trichloro-2, 2 bis [p-chloro-phenyl]ethane)	6 parts

One part of this concentrate added to five parts of water to make the emulsion. (The DDT destroys the pediculi, the benzocaine is ovicidal)

℞

Benzyl benzoate	55 parts
Tween 20 (polyoxyalkylene ether of sorbitan monolaurate)	10 parts
Span 20 (sorbitan monolaurate, technical)	10 parts
Benzocaine	12 parts
DDT	6 parts
Isopropyl alcohol	7 parts

The two formulas are similar in their topical therapeutic effect. They are both conveniently prepared as a concentrate and diluted with water when needed in the same manner and in the same proportion. As with other emulsions, they should be agitated thoroughly before being used. Both preparations are applied with any type of shaker bottle, with a small hand syringe or by hand. According to Eddy the manner in which the treatment is applied is not so important as the doing of a thorough job. To be killed, the eggs must be reached by the emulsion therefore, every hair should be wetted thoroughly The eyes should be covered during the treatment. It is recommended that the hair not be washed until 10 days have elapsed; if it is

Pediculosis Capitis

Pediculosis capitis is an infestation of the scalp and hair with lice (pediculus capitis) Of the three varieties that infest the body the type found in the scalp is by far the most common in children and is more common in girls than in boys Head lice are seldom seen in babies simply because they do not have long hair Negro children also are seldom infested with lice The ratio of white to Negro children affected with pediculosis capitis has been estimated variously as from 20 to 28 Negro children to one white child.*

Clinical Picture.—Pediculosis capitis is an extremely itchy dermatosis both because of the active parasitic infection on the scalp and because of the injection by the pediculus of a substance into the skin. The lesions are generally seen on the occipital area and less frequently upon the parietal areas (Fig. 119) The lesions due to scratching consist of excoriations crusts with an oozing of serum blood and pus. Pustules are the most common lesions In rare instances the discharge of serum pus and blood causes the scalp hair to become glued together in a decomposition of serous exudate, epithelial debris and bacteria accompanied by a disgusting, nauseating odor the so-called "plica polonica

Diagnosis.—Diagnosis is comparatively simple. Often the condition is discovered accidentally in the routine examination of school children. Any itching of the scalp especially of the posterior half should arouse suspicion. By the same token enlarged posterior cervical glands and impetiginous lesions upon the ears, face and posterior region of the neck often disclose the presence of pediculi or their ova, or both upon the scalp

Differential Diagnosis.—*Dandruff* may be differentiated by the fact that the epidermal scale is loosely attached to the hair shaft and is readily removed with a wooden applicator *Trichorrhexis nodosa* is due to a greenstick fracture of the hair shaft and is differentiated easily from nits both by gross appearance and by microscopic examination.

Complications.—Impetigo contagiosa is the most common complication It is caused by secondary infection, the result of scratching. Multiple abscesses of the scalp the result of impetigo contagiosa have been reported. Other complications include eczema (Fig. 120) enlarged posterior cervical and posterior auricular nodes. Secondary anemia has been reported in long standing cases.

Treatment.—Many schools do not permit children to attend classes until the scalp has been cleared of the infestation It is important that the nits be thoroughly destroyed and removed during treatment so as to prevent the ova from hatching and causing a recurrence.

Remedies that destroy the pediculi are known as pediculicides those destructive to ova are called ovicides. While some pediculicides serve a twofold purpose in destroying both parasite and ova most kill only the parasites and leave the ova untouched. The remedies that have been employed in the treatment of pediculosis capitis are legion It is not absolutely necessary to shave the hair completely close to the scalp in the preliminary management although cutting the hair short is often advantageous. An old-fashioned remedy consists of equal parts of kerosene (coal oil) and olive (sweet) oil, applied by rubbing it in thoroughly over the hair of the entire scalp The entire scalp is then covered with a cap or towel which is allowed to remain on overnight. The scalp is shampooed the following morning with tincture of green soap or ordinary soap Petroleum (kerosene) frequently destroys the ova as well as the parasites However to assure that the nits are removed the treatment should be followed by the use of a fine comb dipped in 6 per cent dilute acetic acid (vinegar) or in a solution of sodium carbonate (*not bicarbonate*) Sodium carbonate, also known as "sal soda" and "washing soda, is prepared by adding 1 teaspoonful of the salt to a pint of hot water and letting it cool. Instead of combing the hair a towel may be saturated with vinegar and applied to the hair and left in

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* In this connection Goldman and Friedman's attempt to infect the scalps of two children, using active female parasites and hairs having ova, are of interest. The children were Negroes, each aged 3 years, and were chosen because in the authors experience pediculosis capitis was rare in the colored race in spite of frequent poor hygiene and uncleanliness. After one month the scalps of both children were entirely normal.



Fig. 120.—Eczematized dermatitis secondary to pediculosis capitis, in a girl 8 years of age. Note the numerous scratch marks, hemorrhagic crusts and scales. (Courtesy of Dr Irwin L Lubowe, New York Medical College, Metropolitan Hospital Center)

place for several hours. The scalp is then washed with soap and hot water

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One part of this concentrate is added to five parts of water to make the emulsion. (The DDT destroys the pediculi, the benzocaine is ovicidal)

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Span 20 (sorbitan monolaurate, technical)	10 parts
Benzocaine	12 parts
DDT	6 parts
Isopropyl alcohol	7 parts

The two formulas are similar in their topical therapeutic effect. They are both conveniently prepared as a concentrate and diluted with water when needed in the same manner and in the same proportion. As with other emulsions, they should be agitated thoroughly before being used. Both preparations are applied with any type of shaker bottle, with small hand syringe or by hand. According to Eddy the manner in which the treatment is applied is not so important as the doing of a thorough job. To be killed, the eggs must be reached by the emulsion; therefore every hair should be wetted thoroughly The eyes should be covered during the treatment. It is recommended that the hair not be washed until 10 days have elapsed. If it is

washed a few days after treatment, a second treatment should be given as a safeguard against possible *reinfestation.*

KAISER'S METHOD.—Kaiser used 10 parts of DDT and 90 parts of inert powdered talc. By a small atomizer the DDT powder is sprayed on the child's hair, a paper towel having been placed over the eyes to prevent irritation. A towel or kerchief is then placed over the scalp to prevent loss of the powder and to hold the lice that come to the surface. The child is sent home with instructions to keep his head covered until bedtime. In the morning a fine-toothed comb should be used to remove the dead lice. The child is permitted to return to school the next day after being inspected by the nurse. Even if the nits are not all combed out, the child remains in school and receives daily inspection until the 7th day, when another application of DDT powder is made, following a shampoo given the previous evening. At the end of the second week, another inspection follows. If any nits are detected, a third application of DDT powder is made. Frequently this third application is unnecessary. Meanwhile any member of the family (child or adult) found to harbor the pediculi is given the same treatment. In no case does the nurse apply the DDT powder without written consent of the parent. Kaiser has reported that of 350 children so treated, none had recurrences of live pediculi within the four-week period. Twelve children were later found to have live pediculi but their reinfection was from an untreated source in the home. There were no ill effects of any kind. The method is easy and requires less effort than the use of kerosene. Cooperation of children and most parents is readily obtained when results are proper, quick and certain and accomplished with a minimum of difficulty.

MERCURIALS.—The mercurial remedies for pediculosis capitis include *bichloride of mercury* (corrosive sublimate), 1:5000 to 1:500 in aqueous solution applied for several hours at a time (however, bichloride of mercury is a dangerous remedy to keep around the house); *ammoniated mercury ointment* (ointment of white precipitate), 5 per cent, applied overnight, and yellow oxide of mercury ointment, 1 per cent, applied overnight.

SALICYLIC ACID AND PRECIPITATED SULFUR.—Salicylic acid, 3 to 10 per cent, or precipitated sulfur 5 to 10% may be applied as an ointment in a petrolatum base or in combination, 5 per cent of each in petrolatum and left on overnight.

OTHER REMEDIES.—Cuprex, a solution of copper compound in organic solvents, is a clear pale green or colorless liquid. It is an excellent parasiticide and is used for pediculosis capitis and corporis, for destroying nits as well as lice, fleas, bedbugs and other insects. For head lice and nits, 3-4 tablespoonfuls of Cuprex are gently rubbed into the hair with care taken to avoid the eyes. After two to four hours, the hair is washed thoroughly with soap and warm water and while still damp is combed well with a fine-toothed comb to remove the dead lice and nits. Caution should be exercised to avoid contact with sores and wounds. It should never be used near an open flame.

Other excellent remedies are Eurax and Kwell (p. 313).

Recently Gardner used Kwell shampoo containing as the active agent 1 per cent gamma benzene hexachloride, a potent pediculicide and scabicide. In this preparation the gamma benzene hexachloride is solubilized and combined with surface active agents (surfactant), thus permitting penetration of the pediculi and their ova. After the hair has been thoroughly wetted with warm water, the Kwell shampoo is applied and the lather is rubbed in vigorously for a full four minutes, with care to cover the entire scalp and hairy area. The hair is then rinsed thoroughly and rubbed vigorously with a dry towel. Any nit shells that remain should be removed with a fine tooth comb. In all 47 children treated by Gardner by this method, one shampooing with the preparation completely destroyed all evidence of infection. However, five children required a second treatment for removal of nit shells and three required a second and third visit. There were no untoward reactions.

Representative Prescriptions

℞

Xylol (dimethyl benzene)
Spirit ether, aa q.s. 120.0
Misce et fiat
Signa: Sop hair using 20 cc. (approximately 5

fluid dram for single application) and remove nits

(Sabouraud)

℞
Xylol (dimethyl benzine) 70 0
Petrolatum 30 0
Misce et fiat
Signa Apply at night. Soap shampoo next morning

(Way)

(Xylol destroys nits and at the same time it kills pediculi)

℞
Betanaphthol (5%) 6 0
Liq. petrolatum 120 0
Misce et fiat
Signa: Apply at night. Shampoo following morning

See Formulary ℞ 19 28 38, pediculicide (the advantage of ℞ 28 is that the glacial acetic acid also dissolves and removes nits) 37 ovicide.

Pediculosis Palpebrarum

Instances of pediculosis of the eyelashes (Fig. 121) have been reported even in infants. Infection of children with the pubic louse (*Phthirus pubis*) is acquired through contact especially through sleeping with infected adults.

The ideal treatment appears to be trimming of the eyelashes, followed by a 1 per cent Yellow Mercuric Oxide Ointment U.S.P rubbed into the eyelashes and margin of the lids daily for three to four days. *If this fails to cure stronger ointments should be avoided because* of the possibility of a severe reaction that may follow

Scabies
("The Itch")

Scabies is an *intensely pruritic* dermatosis, highly contagious and characterized by the presence of burrows, papules, vesicles and crusts resulting from secondary infection induced by scratching and subsequent infection of the skin (*Impetigo* contagiosa)

The *term* "scabies" *is derived from* the Latin verb "scabere, meaning to scratch. Scabies is

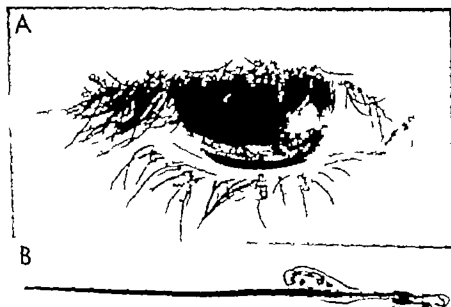


Fig. 121.—Phthiriasis palpebrarum (pediculosis of the eyelashes) of 5 months' duration in a girl 6 years of age. In A, note the numerous ova attached to the proximal ends of the eyelashes of the upper and lower lids. They are present on both right and left eyelids. B shows an ovum attached to the eyelash by chitinous substance. The child also had pediculosis capitis. Pediculus pubis was identified as the responsible parasite in this child, who also had conjunctivitis and blepharitis.

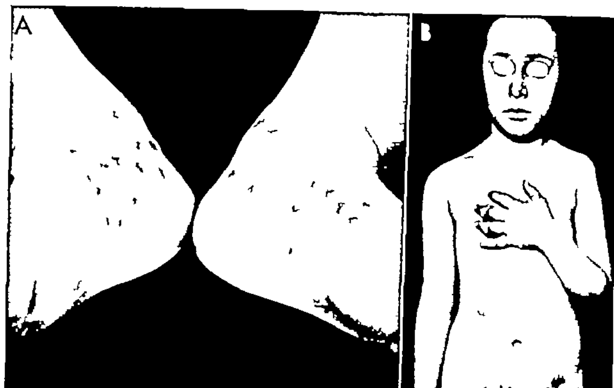


Fig 122.—Scabies. A, Involving the soles of an infant 4 months of age. Both parents and an older sister had scabies. (From the Metropolitan City Hospital, Department of Dermatology New York.) B showing cellulitic pyoderma of the fingers. Note absence of facial involvement. (Courtesy of Dr R. Friedman.)

caused by the organism (mite) known as the Sarcoptes scabiei also referred to as the itch mite." It is a contact disease When one member of the family becomes affected, scabies soon follows among others of the same family Nurslings become infected through contact with the mother's breasts, a favorite area for the itch mite and the lesions of scabies. Infected children transmit the disease, as may such articles as clothing and bedding Untreated or improperly treated scabies may continue for many months It is reported that among babies and children the sexes are equally affected, but that among *adults men are affected about three times as* often as women.

Clinical Picture—The primary lesion is a burrow represented by a wavy line best seen on a palm in babies and on the soles of the feet in children. Burrows are most easily found in young infants who have not acquired the reflex act of scratching. Scratching destroys the burrow However typical scabies is easily recognized The lesions occur as papules vesiculopapules and pustules on the palms and soles of infants (Fig 122 *A*) and as linear scratch marks and burrows. The favorite site is the contiguous areas of the skin of the anterior axillary folds, between fingers and toes, the nipple area in females, the flexor surfaces of the forearm, especially the elbows, ulnar surfaces of the wrists and the external genitalia. In male children, the shaft and glans penis are favorite sites. Also the intercrural folds, the intergluteal fold and the lower half of the buttocks are often affected. Frequently in difficult cases, papules on the abdomen (Fig. 122, *B*) especially surrounding *the umbilicus, serve as a clue. It is* particularly difficult to recognize scabies in persons kept scrupulously clean by frequent bathing The face is involved in nurslings. In short, it is upon the most tender areas of the skin that the female Acarus seeks to burrow and deposit her eggs.

The mite is said to have nocturnal habits, for itching is invariably present at night, although individuals who work at night and sleep during the day complain of daytime itching.

Diagnosis.—Scabies can be tricky infection. At times diagnosis can be made only by exclusion. For an absolute diagnosis, the mites, ova or scybala must be demonstrated. Clinically a point worth remembering is to look for papules around the umbilicus. Finally and practically resort must be had to a therapeutic test with such scabieticidal remedies as sulfur ointment, benzyl benzoate emulsion or some of the newer synthetic chemicals. The promptness with which itching disappears following their use is a specific test that scabies was present.

Differential Diagnosis.—The clinical signs of scabies, especially the burrow but also the distribution of lesions and the severe itching, are points helping to differentiate it from *pityriasis rosea* (uncommon under the age of 5 years) *tinea versicolor lichen planus* and *atopic dermatitis*.

When vesiculobullous lesions are present the burrows and other clinical signs of scabies also serve to distinguish it from *urticaria*, with its sudden onset (unless urticaria occurs with scabies, when it is probably caused by an allergic response to the scabietic mite or its products) *erythema multiforme* with its polymorphous lesions, *drug eruptions*, with their symmetrical distribution and history of ingestion of medicaments; *pemphigus*, which is rare in children *varicella* and *variola*, *pediculosis corporis* in which the lesions are larger and of a different type and distribution, and *lichen urticatus*, in which, in contrast to scabies, the abdomen is usually free of lesions and the lesions are mostly distributed on extensor surfaces of upper and lower extremities and on the forehead. When vesicles or bullae occur on the soles and palms of infants, *syphilis* can be ruled out by the absence of other concomitants of syphilis and by roentgenographic study of the long bones.

Complications and Prognosis.—Eosinophilia and albuminuria frequently occur Impetigo contagiosa is the most common complication of scabies, especially in infants. Eczema and urticaria may occur: ecthyma may be induced by scratching. Adenitis may follow especially of the inguinal and axillary glands.

Scabies yields promptly to antiscabietic therapy The cure that follows use of sarcopticides, including sulfur the "sovereign remedy" is proof of the specificity of such drugs. Today the use of newer agents such as benzyl benzoate, Kwell ointment, Eurax ointment and similar remedies has shortened the treatment period from a week or ten days to a few days. Nevertheless, postscabietic itching (pruritus habitus) may continue for days or weeks after all lesions have disappeared.

Prophylaxis.—All infected members of the family should be treated at the same time. Recurrence should be prevented by proper disinfection of underwear linens and bedclothes. Isolation will prevent spread to uninfected persons.

Treatment.—Treatment is begun by giving the child or infant a full warm tub bath with soap using a moderately stiff hairbrush to break open the burrows. By exposing the itch mite and its ova to direct attack by the scabieticidal remedy optimum therapeutic effects are assured. Tincture of green soap is satisfactory for this purpose, although any ordinary soap, such as Ivory or castile, serves as well. After the initial soap and water bath, the skin is carefully dried and the scabieticidal remedy is applied. During treatment, the same underwear may be worn. However at the conclusion of treatment, fresh underwear linens, and outer clothing should be used. Garments previously used should be disinfected by boiling or dry cleaning, or they may be disinfected by being placed in a bag with a broken ampule of methyl bromide and, after 45 minutes, removed and thoroughly aired. I also like sprinkling precipitated sulfur between bed linens and blankets as a prophylaxis. It is worth remembering that the scabietic mite can live in underwear and bed clothing for at least three or four days.

In treating children for scabies, the entire body from neck to toes should be covered with the remedy In infants, the face also should be covered with the remedy In using sulfur the precipitated form (not the sublimed) is the preparation of choice. Topical application should be made thoroughly but without too much friction. For infants, 3 per cent of precipitated sulfur should be prescribed, for children 6 per cent. Since the mite and its ova are found only in the stratum corneum, the ointment base may be either petrolatum or benzoinated lard. Because

pruritus habitus is common in children it should be a rule before retreatment to make certain that the Acarus and its lesions are still present otherwise sulfur dermatitis may follow Occasionally diffuse exfoliative dermatitis covers the entire body after a course of sulfur therapy particularly in infants with tender skin. This condition is invariably improved by use of emollient and antiphlogistic remedies.

Generally when one member of the family is infected children of the same family are easily infected. If any doubt exists as to the presence of scabies in children a safe rule is to treat all members of the family at the same time.

The presence of impetigo contagiosa on buttocks and thighs should lead one to search for scabies, both in the patient and in other members of the family

BENZYL BENZOATE —Benzyl benzoate emulsion is generally marketed in 50 per cent strength in 2 fluid ounce bottles. The patient is given a warm 10-minute bath during which the skin is thoroughly cleansed with soft soap While the skin is still wet, the emulsion diluted to the appropriate strength (see Table 19) with water is vigorously rubbed into the skin or used as a spray and the same underwear is replaced The treatment is repeated without a bath in 12 to 24 hours followed by another bath in 24 hours and fresh underwear In infants the emulsion should also be applied to the face Another method is to dilute the 50 per cent emulsion with an equal quantity of water and apply as a paint with a brush. This treatment is also preceded and followed by a hot bath. Cure generally follows in 48 hours. Fresh underwear and bed linen should then replace the old. This procedure should be repeated for a recurrence.

It is important to warn the patient that itching seldom disappears after the first course of treatment, although invariably it is milder In fact, since it usually takes a week to 10 days for the itching to disappear completely recurrence should not be diagnosed for at least two weeks after treatment has been completed.

TABLE 19—USEFUL SCABIETICIDAL REMEDIES FOR INFANTS AND CHILDREN

DRUG	PRESCRIBED AS	STRENGTH
Benzyl benzoate	Emulsion	5-10% (infants and young children) 25-50% (older children)
Precipitated sulfur	Ointment (alone) or with balsam of Peru	2 3% (infants) 6% (children) 10% (older children)
Balsamic resins Peruvian balsam	Ointment or combined with 5% sulfur as an ointment	2% (infants) 5% (children)
Styrax (storax)	Combined with olive oil	25% (infants) 50% (children)
Hexachlorocyclohexane	Kwell ointment in a vanishing cream base	1% (infants and children)
N-ethyl-o-crotono-toluide	Eurax Cream	10% (infants and children)

Eddy's formulas, described under Pediculosis Capitis (p 307) are serviceable for the treatment of scabies also The formulas should be diluted with 5 parts of water and sprayed on the skin with an insecticide gun after an initial bath and drying of the skin. A follow-up bath is given 24 hours later (Two ounces of the mixture is sufficient for a single application.)

The following formula (marketed as Tyroscabo) has also been used successfully

℞

Benzyl benzoate	36.010%
Tyrothricin	0.053%
Benzocaine	3.230%
Inert	60.702%
Alcohol	56. % by vol.

Misce et fiat

Signa After first opening blisters and removing crust with a needle the patient takes a warm bath with soap and water The skin is dabbed

dry and the solution is rubbed on lightly from neck to toes twice daily for the next two successive days. A bath is taken after the second day and all bedclothes and underwear, towels, etc., are sterilized by boiling

The advantage of this preparation is that, in addition to its scabieticidal effect, it contains tyrothricin, which overcomes the secondary infection almost invariably present in children.

SULFUR.—Although sulfur has largely been replaced by some of the newer chemicals and the benzyl benzoate emulsion for treating scabies, it is useful for those children and infants in whom some of the newer preparations irritate the skin. In prescribing sulfur ointment (Table 19) only precipitated (not sublimed) sulfur should be used. The average child will require approximately 6-8 oz. (180-240 Gm.) While sulfur ointment requires a week to 10 days for cure, it seldom fails as a scabieticide and is rarely followed by a dermatitis if it is used properly

The rule for treating scabietic infants and children with sulfur ointment may be summarized as one night of scrubbing—three nights of rubbing.

BALSAMIC RESINS.—Of the various balsamic resins used as scabeticides, two in particular have been popular storax (styrax) and Peruvian balsam.

The balsamic resins are particularly useful in treating infants less than a year old for scabies when sulfur and the other synthetic chemicals are poorly tolerated by the skin and act as irritants. Furthermore, the balsamic resins combined with sulfur serve as synergists. The following prescription is illustrative

℞

Peruvian balsam (2%)	4 8
Precipitated sulfur	12 0
Zinc oxide ointment	240 0

Misce et fiat unguentum

Signa: Rub into skin from neck to toes for three nights preceded and followed by hot bath

In prescribing styrax for infants, the following schedule may be used

℞

	(Under 1 Year)	(1 2 Years)
Styrax	25 per cent	50 per cent
Olei ol q s ad	100 per cent	100 per cent

Misce et fiat

Signa: Apply by inunction from neck to toes (infants under 1 year of age, face included) twice daily morning and night for three consecutive nights preceded by and followed with warm bath. Discard old underwear, bed linens, etc., disinfect by boiling. Supply fresh linens and underwear

N ETHYL-O-CROTONO-TOLUIDE (Eurax, 10 per cent Crotonyl-N-Ethyl-O-Toluidine Ointment) —This synthetic chemical is a colorless, odorless, stable liquid, relatively insoluble in water but readily soluble in ether acetone, alcohol, fats and oils. Its high bacteriostatic action renders it of value in treating secondary infection in scabies. No serious side reactions have been reported. An additional advantage is that it serves as an antipruritic as well as a scabieticide.

Treatment with the 10 per cent N-ethyl-O-crotono-toluide may be by one of two methods. In one, the patient takes thorough bath at bedtime. After the bath, half the contents of the tube (70 Gm. per tube) is rubbed well over the entire body from the angle of the jaws to the soles of the feet· the remaining half of the tube is applied next evening at bedtime and the following morning a second bath is taken. Clean clothing is then put on and the contaminated clothing, linens, etc sent for proper laundering. In a second method, the bedtime bath is followed by a single application over the entire body The second bath is taken the following bedtime, 24 hours later

HEXACHLOROCYCLOHEXANE (Kwell) —Chemically this compound is 1,2,3 4,5 6, hexachlorocyclohexane, $C_6H_6Cl_6$. It is an effective scabieticide, pediculicide and insecticide when employed in 1 per cent strength in a vanishing cream base. The chemical occurs as a white solid and has a faint, not unpleasant odor

A thin film of the cream is rubbed into the entire skin surface of infants and from the neck to the sole of the foot in children without preliminary bathing. A bath is given after 24 hours and is followed by fresh underwear and night clothes at the same time the bed linens are changed for laundering before re-use. Patients are re-examined after one week and weekly thereafter until the eruption has entirely disappeared. If there is a recurrence of activity or any considerable pruritus, the treatment is repeated. I have employed Kwell Ointment in more than 100 patients, children and adults, at

the Philadelphia General Hospital with favor able results. Occasionally a slight irritation of a child's skin is observable, but in general cure is *prompt* and rarely is a second course required.

See Formulary ℞ 21 for sulfur dermatitis.

Creeping Eruption

(Larva Migrans, Dermatitis Linearis Migrans, Sandworm Disease)

Creeping eruption is an acute inflammatory condition of the skin characterized by raised linear progressing lesions due to the larva of the cat or dog hookworm

Creeping eruption may be caused either by the larva of the various flies such as the horse-bot fly (Gastrophilus) and the cattle heel fly or more usually *by the third-stage larva of one of* the dog or cat hookworms (Ancylostoma braziliense) The latter is most common along the southern Atlantic and Gulf coasts but has been reported as far north as New England.

The infection is very common in children who walk barefoot on the beach or play in sand piles.

Clinical Picture.—The entrance of the larva into the skin is frequently accompanied by an intense tingling sensation Soon a papule forms followed by a characteristic raised linear erythematous track (Fig. 123 *A*) The feet are most commonly involved usually the plantar or dorsum surfaces the hand anal folds, buttocks and thighs also are often involved but any area *of the skin including the face, may be affected*

The primary lesion the inflammatory papule which marks the site of ingress of the larva into the skin, when it is discovered has already been present from several hours to several days. The papule is followed by a dark red threadlike line slightly elevated and blunted *which represents the burrow of the nematodal* larva This red line may be tortuous polycyclic straight or serpentine (Figs. 123 *B* and *C*) it advances at the rate of ¼ to 1 inch or more per 24 hours Advancement of the burrow may be interrupted by periods of quiescence. *Other* lesions including vesicles bullae and hemorrhagic areas, may accompany the eruption either as part of the clinical pattern or as the result of secondary infection In children pyoderma, the result of scratching is not infrequent. Localized areas of urticaria and edema may occur Itching the most characteristic symptom is invariably worse at night owing to the fact that the burrow is being extended. Itching may be so intense and of such severity *that the patient cannot sleep*

Diagnosis.—Diagnosis is comparatively easy although occasionally secondary eczematization due to the use of irritating lotions and ointments may obscure the characteristic picture The conditions most likely to be confused are scabies, prurigo mitis and insect bites.

Differential Diagnosis.—The burrow of larva migrans is usually much longer than that of *scabies* and on this point alone a diagnosis may ordinarily be reached. Usually difficulty in diagnosis arises when a single papule or a number of papules and vesicles are present, particularly upon the plantar surface of the foot Suggestive of scabies however are a wider distribution of lesions upon the anterior axillary folds, over the elbows and the anterior aspect of the wrists, between the webs of the fingers and between the toes, and *especially* the presence of papules upon the abdomen surrounding the umbilicus. The infection of other members in the family and the improvement that follows scabietic treatment favor the diagnosis of scabies. The finding of the acarus *itself* is of course *proof of* scabies.

The lesions of prurigo mitis are very pruriginous and appear traumatized through scratching. In contrast to creeping eruption, the essential lesions are pale red nodules, from pinhead to hemp seed in size and distributed principally on the extensor surfaces of the extremities.

The lesions of insect bites generally appear on th exposed parts of the body A central punctum may be found if the patient is seen soon after the bite but it usually disappears after several hours. The bites may be surrounded by a zone of erythema and an urticarial element is often present. The presence of fleas mosquitoes, etc. *in the home or vicinity of the patient* is helpful in the diagnosis.

Complications.—Impetigo contagiosa the result of secondary infection due to scratching, often complicates the picture of creeping eruption.

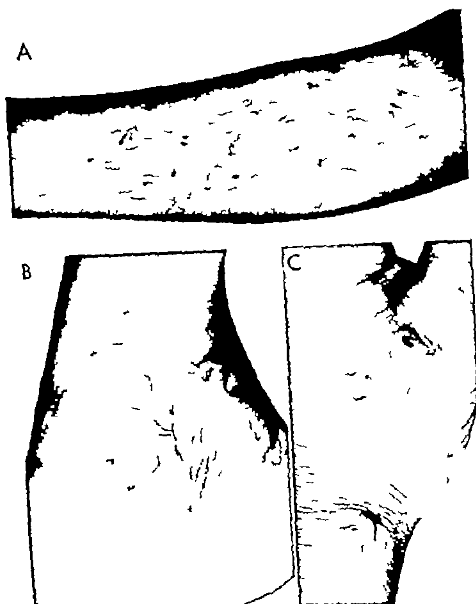


Fig. 123.—Creeping eruption (larva migrans). A, in girl 9 years of age. Note the widespread papular eruption and the characteristic threadlike serpiginous tracts. (Courtesy of Dr. Henry George Morton.) B, on the foot of another child, and C, on the hand of a child in whom the lesions have been secondarily infected. (Courtesy of Dr. Harvey Blank, Professor of Dermatology, University of Miami Medical College.)

Prophylaxis—The essential point in prophylaxis is the institution of measures that will prevent the larvae extruded from the bowels of animals on the beach from being deposited and reaching the skin of uninfected persons. This means that children and adults should avoid infected areas, often indicated by moist soil and sand and particularly that they should not walk barefoot along the beach. While perspiring, all persons should avoid coming in contact with sand All dogs and cats should be kept from the beach. Sand at home should be sterilized by oven-baking and dogs and cats should be kept from contaminating it. Finally the physician should be educated to make the diagnosis early and institute adequate and proper treatment.

Treatment—Treatment consists in the use of agents destructive to the larvae

REFRIGERATION—All the bullae and pustules when first seen should be opened and drained and treated locally with an antiseptic such as Burow's solution. Then after the secondary infection has subsided and the active lesions become well defined, refrigeration can be used. This treatment should be continued until the itching is no longer present and no active lesions observed. Freezing with *ethyl chloride* will kill the larvae with few failures. Improvement (and cure) generally follows a comparatively few applications The spraying with ethyl chloride should be done at the site of the advancing lesions for two minutes at a time until a blanched white appearance of the skin occurs. *Carbon dioxide snow* (dry ice) also is effective but it is generally more painful than the use of ethyl chloride. Carbon dioxide snow should be used with moderate pressure for 45 seconds to one minute for one or two days successively or every other day

ANTIMONY COMPOUNDS—Fuadin (sodium antimony bis-catechol) and Neostiban (diethyl amine para-amino-phenylstibinate) have also been recommended for the treatment of creeping eruption, but in view of other more conservative methods it would be better to discard them entirely

CAUTERIZATION OF SKIN AT SITE OF PARASITE.—Preliminary to cauterization the larva can be discovered by clearing the skin with cedar wood oil. The ends of the burrows, in which the larvae may usually be found, stand out clearly as white spherical masses because of the presence of plasma which surrounds them. After the skin is cleared 2 minims of 1 1000 procaine is used to desensitize an area ½ inch in diameter with the larva as its center The cautery is then used until a small burn is produced. Sulfanilamide 7½ grains, is prescribed for two days

Rat Mite Dermatitis

Rat mite dermatitis is characterized by an erythematomacular papular or vesicular eruption which is caused by the mite *Liponyssus bacoti*

Etiology—The cause is a blood-sucking mite, Liponyssus bacoti (Fig 124 *A*) The mite normally feeds on rats but also attacks human beings. Natural hosts of the mite are brown and gray rats (Rattus norvegicus and R rattus)

The condition is fairly common in infants and children. Haggard explained the life cycle of the mite as follows After engorging with blood the mite falls off the rat and seeks hiding places in cracks and crevices about rat runways. Here they moult and gaud females deposit eggs. All stages are thermotropic and attracted by hot water pipes, stoves, warm storage areas and cracks around heaters and radiators in kitchens, bathrooms and basements. A four-day period permits the eggs to hatch, after which the young join the search for food. After moulting or ovipositing, mites again seek rats for another blood meal if rats are not available, other warm-blooded animals may be attacked. If the mites cannot obtain a blood meal in 10 to 18 days they die During this period they are very active and range far distances, perhaps as far as several yards.

Clinical Picture—The primary lesions consist of a number of small papules vesicles and wheals (Fig. 124 *B*) the size varying from pinhead to small pea or even larger depending on the reaction of the skin to the host. When a lesion is examined carefully a small punctum (occasionally a vesicle) is found located in its center Frank vesicles are often present in children or the rash may be seen as a varicelliform eruption or as a typical papular urticaria.

The areas of predilection include the face, hands, ankles, legs, thighs, belt line, upper shoulders and neck. In both adults and infants there is a definite tendency for grouping of the bites. In children in particular the rash may be either profuse or limited to small areas e.g., the ankles. As a result of scratching, excoriations and pustules not infrequently follow the traumatic dermatitis. Itching is either moderate or severe. A transient fever which lasts for a few days and which is toxic in nature, may occur bites due to chiggers, grain and harvest mites and bird mites. Other conditions for which a differential diagnosis is necessary include scabies, pediculosis corporis, lichen urticatus, and other forms of acariasis.

Prognosis.—The exanthem clears up in about two weeks after the patient is transferred from his mite infested atmosphere

Prophylaxis and Treatment.—The patient should be removed to a noninfected environment. The mites are best destroyed by fumiga-

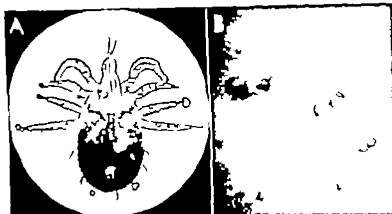


Fig. 124.—Rat mite dermatitis. A shows the rat mite, Lyponyssus bacoti (Hirst 1914) Four pairs of legs, palps and chelicerae fused head and thorax. Hexapod larva develops into octopod nymph. B shows representative rat mite lesions—vesicular pustular papular macular and some hemorrhagic areas, with a tendency toward grouping of bites—in baby

tion with hydrocyanic acid gas, which is a most effective weapon. However special technic and care are required in using this gas for infested buildings and homes. Temporary relief from mites may be obtained by spraying or fogging infected premises with insecticides, especially benzene hexachloride solution.

Diagnosis.—When a parasitic infection is suspected a definite diagnosis cannot be made until the parasite has been found and identified. A careful history is most important as this will often indicate in what direction one should conduct a search. Rat mite dermatitis may occur almost anywhere. Scabies and pediculosis can usually be excluded on clinical grounds, but in other cases a differential diagnosis depends on the recovery and identification of the mite. Rat mite dermatitis should be suspected when the clinical picture simulates scabies, pediculosis or the bites of other parasites, when one is unable to find the causative parasite or when specific scabieticidal, pediculicidal or parasiticidal remedies fail as therapeutic remedies. The Weil-Felix reaction becomes positive for a short period with agglutination at dilution of 1 320.

Rat mite dermatitis should be differentiated from chickenpox, bed-bug bites, flea bites and

Antipruritic topical remedies such as 1 per cent phenol in calamine lotion may be employed.

Bedbugs

(Cimex Lectularius)

Cimex lectularius (bedbug) produces not only a moderately itchy lesion but a peculiarly vile odor due to a clear volatile oily liquid secreted by glands in its body Bedbugs live in mattresses, beds, wallpaper cracks and crevices of furniture floor and walls and even on mice.

They sometimes migrate from house to house.

Clinical Picture.—The areas of predilection for bedbug bites are the ankles, buttocks knees and shoulders. The initial lesion is usually an urticarial wheal varying in size from small pea to bean The bite strikingly characteristic, consists of either paired or *triplicated lesions* occurring in a straight row Examined more closely the lesions consist of hemorrhagic papules, sometimes of vesicles bullae, purpuric spots, pustules and crusts

Scratch marks are frequently present made in response to pruritus induced by the bite and the secondary infection (impetigo) that may follow At times the punctum of the bite may be seen. The patient may complain of a burning or stinging sensation following the bite but it seldom produces pain or swelling unless it is rubbed or scratched Apart from itching there are no constitutional symptoms.

Diagnosis.—Diagnosis is readily made if one remembers the characteristic areas of distribution of the lesions viz. ankles, buttocks, shoulders and knees, although any part of the skin may be affected. One should look also for the 1,2 3 sign —the two or three papules in a straight row

It can be distinguished from *urticaria papulosa* in which the lesions are symmetrically situated upon the extensor surfaces of the upper and lower extremities and on the forehead and face. In urticaria the lesions are evanescent and usually more widespread over the body than are *bedbug bites*.

Complications.—Generally the bedbug is a night feeder and causes restlessness and sleeplessness. It generally does not transmit disease As far as is known there are no constitutional symptoms.

Prophylaxis and Treatment.—The introduction of DDT has revolutionized the prevention of bedbug bites. The insects are best destroyed by the use of 5 per cent DDT in a gasoline spray in the crevices of the furniture, and on the floor walls and other places of habitation *Studies* by the United States Department of Public Health and others have shown that DDT is the most effective weapon against the bedbug

Wet dressings consisting of a 1 10 or 1 20 Burow's solution (Aluminum Acetate Solution U.S P) should be used during the acute stage. This treatment should be *followed by 1 per cent* ichthammol in either zinc oxide (Lassar's) paste or zinc oxide ointment Impetigo contagiosa as it arises in connection with the bites should be treated according to the methods described in *Chapter 15*

Representative Prescription

℞

Menthol (1/10%)		0 09
Camphor spirit		45 0
Alcohol (70%)	q.s. ad	90 0

Misce et fiat

Signa Local pplications

Indication Acute edema and itching

See Formulary ℞ 5 antiphlogistic and astringent, 67 *antipruritic and antiphlogistic*.

Ticks

Ticks are not insects but blood-sucking arthropods technically they belong to the Ixodidae. They burrow into the skin and by sucking blood fill the stomach so that their body swells enormously often to the size of a pea or small bean. If the tick is let alone it usually drops off in a few days. On the other hand, if it is pulled off forcibly it is apt to break off leaving its tentacles (or mandibles) embedded in the skin, whereupon an inflammatory reaction will follow causing annoyance and discomfort. The attached tick, appearing as a small nodule on the skin may be mistaken for a pedunculated tumor or a wart

Etiology.—There are three *varieties of ticks* (1) Dermacentor variabilis known as the Eastern wood tick and the American dog tick (2) Dermacentor andersoni known as the Western dog tick and Western wood tick (3) Rhipicephalus sanguineus, or the brown dog tick

Dermacentor variabilis is widely distributed in this country over the entire area bounded by the Atlantic Ocean on the east and a line on the west extending north and south through eastern Montana and Utah and the middle of Texas. It has also been found in several localities of Oregon and throughout California. It possibly exists sporadically in New Mexico Colorado and Arizona it has been reported in Alaska and is present in Canada as far west as Auverne, Manitoba.

The normal feeding season of the adult tick begins in early spring (March or April) and ends with hot, dry weather (June or July). The normal life cycle is two years. Interesting is the fact that the tick is able to go as long as two to four years without food while waiting to attach itself to a suitable host. It has been estimated that approximately 300 eggs are laid each day and that the average female deposits altogether as many as 6000 eggs.

Clinical Picture.—The local effects of tick bites are due to a local anesthetic and anticoagulant action. The pseudotumor has been mentioned, but the lesion itself may assume the appearance of a fibrous nodule.

Slight itching is sometimes present after the tick has dropped off with slight bleeding following or entirely absent. The lesion consists of a bright red nodule, ¼ to 1 inch in diameter. Very slowly it shrinks in size; meanwhile the color fades to white.

Of far greater importance than mere annoyance to children is wood tick paralysis, the symptomatology of which is similar to poliomyelitis in the initial stages but which disappears promptly as soon as the tick is removed from the skin. On the other hand, if undiagnosed and the tick is not removed, the ascending type of paralysis (motor paralysis) may be fatal. Tick paralysis is reported to occur in 10 children to one adult.

Diagnosis.—The clinical diagnosis cannot be made from the appearance of the lesion, since it resembles fibroma. The most important single sign for correct diagnosis is the finding of the tick. When paralysis is present, usually a progressive ascending type but afebrile, one should suspect the wood tick as a possible cause and search for it. Such suspicion is heightened if the child has been in woods where ticks may be found. Actual proof, however, consists in finding the tick and the improvement that follows its removal. Thus also will diagnosis of fibroma be ruled out.

Complications.—The general effects of tick bites are (1) allergic (anaphylaxis) (2) toxic (3) rickettsial (Rocky Mountain spotted fever) (4) bacterial ( ) streptococcic (sepsis) (b) tularemic (lower extremities) (5) spirochetal (relapsing fever).

In the United States, 13 species of ticks are found; five species carry disease but three only indirectly connected with disease in man. Paralytic effects are limited to the wood tick. The Rocky Mountain wood tick (Dermacentor andersoni) is an agent in the transmission or causation of Rocky Mountain spotted fever, tularemia, tick paralysis and Colorado tick fever.

Prognosis.—Rapid improvement usually follows within 48 hours of removal of the tick from the skin. However, respiratory paralysis and death have been reported in children when ticks were not removed promptly or when their presence upon the skin was overlooked.

Treatment.—Prophylaxis consists in avoiding those areas where ticks are known to be found. Prevention of paralysis from the wood tick is achieved by discovering the tick and removing it promptly.

Forcible methods for removing ticks from the skin should be avoided. During World War II, soldiers said "Don't yank him off; screw him off," a direction which well described the gentleness with which ticks are to be removed from the skin, very much as one would remove a screw. Sometimes a small quantity of tobacco juice or a lighted cigarette cautiously applied to the body of the tick will cause it to shrivel up and fall off. Similarly application of gasoline, benzine, turpentine and chloroform will cause the tick to drop off.

The best method for removing ticks involves mechanical obstruction of the tick's breathing pores, thereby causing it to withdraw spontaneously. This is accomplished by the application of oily substances such as kerosene, mineral oil, glycerin and lead oleate ointment. But one must be patient and not expect spontaneous withdrawal within moments. Removal sometimes takes hours and in any case, mechanical removal should avoid tearing off the body from the implanted head, which, when left, still acts as a foreign body. Xylol and ether should not be used, for they kill the tick before it withdraws the barbs of the hypostome without which complete removal is impossible. Satisfactory treatment is attained only by removal of the nodule by punch or cauterization of the smaller lesions and excision and suturing of the resultant wound in large lesions.

Fleas
(Pulex Irritans)

The flea is a wingless insect with six legs and a laterally compressed body It is found mostly on dogs and cats. Fleas may transmit typhus and plague The three species of flea most commonly attacking man in the United States are the human flea (Pulex irritans) the cat flea (Ctenocephalides felis) and the dog flea (Ctenocephalides canis) In the eastern United States the dog flea is the dominant pest in the South and West the human flea In California the human flea and cat flea are equally dominant.

Clinical Picture—The flea's bite is recognizable as a papule with a central punctum which soon transforms into an urticarial wheal. The lesions are grouped and pruritic although they are linear at times Most often they occur along the waist line or on hips or shoulders but any part of the skin may be affected The flea bites in an irregular but grouped pattern. Scattered or satellite lesions also may be found Petechiae purpuric spots and areas of erythema may be seen and rarely bullous or purpuric lesions (purpura pulicosa) In addition, as a result of the antigen injected by the flea, there may be a generalized urticarial reaction manifested even at points distant to the bites.

Diagnosis.—Diagnosis is comparatively simple based on the traumata caused by flea bites (1) A small papule showing a tiny hemorrhagic center (or punctum) which is slightly itchy and gone within a few hours, or (2) a larger hard erythematous papule or (3) a bullous and purpuric lesion accompanied by itching The grouping of the lesions and a history of the arrival of newcomers in the area, especially children or the newborn are important points in diagnosis The discovery of insects in the room or in the vicinity is often helpful

Differential Diagnosis.—It is becoming increasingly evident that many cases of *urticaria papulosa* are caused by fleas and other insects However in the group in which foods or factors other than flea bites play a part, the symmetrical distribution of the lesions on the extensor surfaces of the upper and lower extremities and the absence of a punctum (if the lesions are seen soon after their appearance) may rule out flea bites.

Complications.—Complications include impetigo contagiosa due to scratching. Recurrent furuncles are common Generalized pruritus, urticaria, asthma and angioneurotic edema also have been reported

Prophylaxis.—The value of flea extract as a desensitization agent is controversial. Thiamine hydrochloride in doses of 10 mg. three times daily for infants and double and quadruple that dose for older children and adults has been used as a repellent with excellent results. The best and quickest way of controlling fleas is by the newer insecticides known as repellents Among the more useful for this purpose are DDT pyrethrum powder rotenone, gum camphor and citronella oil and other essential oils.

DDT (dichloro-diphenyl-dichloro-ethane) is also known as gesarol and neocid. It may be used as 5-10 per cent dusting powder sprayed into carpets floors, furniture on the floor and in the basement It is not essential to apply the powder to animals although it may be sprayed into their kennels or nests. One such spraying every two months will usually keep the animals free from fleas. DDT may also be prepared in a kerosene-type base for use on walls or as a residual spray for flies, mosquitoes and other insects. *Pyrethrum* powder (also called insect powder) may be worn in a little bag next to the skin or sprinkled on the floor *Rotenone* is the chief constituent of derris and cube roots. It may be used as a powder which should contain at least 0 75 per cent. It is expensive. *Gum camphor* is often placed in a little bag attached to a string tied around the neck of children. *Citronella oil* and other essential oils may be painted lightly on the skin of the forearm or thigh or sprayed on the floor or in the room. Other essential oils used as repellents include bergamot, cassia wintergreen lavender and oils of cedarwood eucalyptus and pennyroyal.

Treatment—During the acute stage of swelling pain and pruritus either with or without obvious oozing at the site of the lesions. continuous wet dressings should be applied and continued for 12 to 24 hours or longer Aluminum acetate (Burow's) solution 1 10 or 1 20 should be applied ice cold or if not well toler

ated, at room temperature. Other agents used as wet dressings include potassium permanganate, 1:20,000 to 1:10,000; silver nitrate solution, 0.1 to 0.25 per cent; infusion of chamomile or epsom salt (magnesium sulfate) 1 teaspoonful to a glass of water.

Following the acute edematous stage, pastes or ointments containing from 0.5 to 1 per cent of ichthammol are very useful. Menthol, 0.5-1.0 per cent, in 70 per cent alcohol or camphor spirit (undiluted) is a topical remedy that may be ordered for the relief of itching. Antihistamines in the form of elixirs of Benadryl, Pyribenzamine or of Neobetramine, have also proved valuable when administered in dose of 1 or 2 teaspoonfuls or more, up to 1 tablespoonful, repeated every three or four hours.

Since the lesion involves the corium, intramuscular doses of procaine penicillin G (300,000 units) in oil or in aqueous menstruum should be administered and repeated in 4 hours to prevent ecthyma and the possibility of scar formation.

Representative Prescriptions

℞
DDT (5%) 6.0
Calamine Lotion U.S.P. 120.0
Misce et fiat lotio
Signa: Apply to patient's skin (forearm, etc.) three times daily

(Shaffer, Spencer Blank)

℞
DDT (5%) Flit
Signa: Spray in breeding places, rooms, basement
(Shaffer, Spencer Blank)

℞
Repellent 612 (2-ethyl, 1 3 hexanediol)
Signa: Apply or use as spray

℞
Diethylene glycol monobutyl ether acetate
Diethylene glycol monoethyl ether aa
Alcohol 63%
Corn oil 23%
Misce 7%
Signa: As spray
(Note: Also effective against mosquitoes, chiggers and flies)

(Cook, E. F. and Martin, E. W.: *Remington Practice of Pharmacy* [Easton, Pa.: The Mack Publishing C. ed. 9])

℞
Dimethylphthalate 6 parts
Indalone (butyl mesityl oxid-oxalate) 2 parts
Rutger's 612 (2-ethylhexanediol-1, 3) 2 parts
Misce
Signa: Place ½ teaspoonful upon the palm, rub hands together and apply to exposed parts. CAUTION: Care eyes and mouth (effect lasts 2 hours). Spray on clothes. Good for several days. (May also be used for flies, mosquitoes, gnats, mites and fleas)

(Cook, E. F. and Martin, E. W.: *Remington Practice of Pharmacy* [Easton, Pa.: The Mack Publishing Co. ed. 9])

See Formulary ℞ 3 continuous wet dressing (astringent); 5 cold wet dressing (astringent); 30 *for subacute stage;* 84 antiphlogistic (astringent); 85 antiphlogistic and antipruritic.

Chigger Bites

(Trombidiosis)

Bites from chiggers (also known as "harvest mites," "red bugs" and "sea ticks") are particularly common during late summer and early fall. The chigger mite can scarcely be seen without a hand lens. Occasionally it appears as a deep red dot on the skin. The color may vary from scarlet to light yellow or orange. Chiggers usually attack the exposed parts of the body and tend to congregate in constricted regions such as below the belt or beneath garters. The lesions in these areas become grouped. They consist of papules, vesicles or bullae, the latter possibly hemorrhagic. Frequently each lesion is surrounded by a pinkish wheal. The pruritus, often severe, may last for days or even weeks. Lymphangitis is an occasional complication. Bites may be attended by mild constitutional symptoms such as fever, headache and malaise.

Treatment consists in the early *removal* of chiggers from the skin with a blunt needle before they have had time to burrow deeply. The use of carbolated petroleum *jelly* or *0.5* per cent phenol added to calamine lotion and applied every three hours to the lesions and the use of the antihistaminic remedies both internally and topically in the form of ointments or creams are helpful for pruritus. For secondary infection the broad spectrum antibiotics may be prescribed topically.

Black Widow Spider

The black widow spider (Lactrodectus mactans) also known as the "hour glass," "T-dot," "Po-Ko-Moo" and "shoe button spider" is easily recognized by its coal black appearance with orange or scarlet markings. The black widow is so called because she kills and sucks out the tissue juices of the male after her eggs are fertilized. The name "shoe-button spider" indicates the black globoid abdomen like a black shoe button.

It is the female that bites. The black widow is common in the southern states, in dimly lit and secluded premises such as privies, basements, garages lumber piles and even beneath stones. The bite of the ordinary spider is characterized by an urticarial wheal After the black widow bites, there is a sharp stinging sensation and severe but transient pain occurs at the site. Soon there follows a spasm of the voluntary muscles and acute pain (cramps) in the abdomen and in the legs, arms and back of the shoulders. This pain may be so severe as to cause the patient to cry out. Other symptoms and signs included in the syndrome known as "arachnidism" are restlessness irritability muscular twitchings, tremors, profuse cold sweating and collapse Dyspnea, nausea and vomiting also are frequent. Convulsions are *particularly common among infants and young* children.

The clinical picture of the patient suffering from arachnidism is quite typical The thighs are usually flexed upon the abdomen the legs flexed on the thighs, the arms folded on the chest. *The most prominent and almost* universal physical finding is a boardlike abdomen that is not tender to palpation. Inspection of the area bitten reveals tiny pinpricks on the skin or two tiny red spots with only slight localized edema. Presumably the symptoms and signs are caused by a poisonous substance of the nature of a toxalbumin

The most frequent site of the bite is from the buttocks down although some investigators assert that the upper body is most frequently bitten The mortality is reported to be 5 per cent.

Management of the black widow spider bite is directed primarily to relief of the excruciating pain. Hot baths have been more successful in this respect than any other treatment except the specific antivenin, even though the rapid relief obtained is only temporary

Antivenin serum is a specific for black widow spider bites and relieves symptoms within one to two hours. The dose, 2.5 cc. given intramuscularly may be repeated in one to two hours Other remedies sometimes useful include subcutaneous injections of morphine sulfate in doses of 0 008 Gm (1/8 grain) to 0 030 Gm. (1/2 grain) depending upon the age of the patient 5 to 10 cc. of 10 per cent calcium gluconate or magnesium sulfate given intravenously atropine sulfate 0 00032 Gm. (1/200 grain) to 0 00065 Gm. (1/100 grain) given intramuscularly and sodium phenobarbital, 0.2 Gm. (3 grains) to 0 3 Gm. (5 grains) given intramuscularly

Black Flies

Black flies (simuliidae) are frequently found in the country In woods particularly colonies of black flies are of considerable annoyance. Accordingly children attending picnics are often bitten. The lesions following bites by black flies are not immediately painful but pain usually follows after a day and is accompanied by *redness and edema at the site* One of my patients, a girl 10 years of age, while picnicking was bitten by innumerable black flies. The lesion consisted of a demarcated erythematous plaque about the size of a five cent piece on the right cheek. Within the border of the plaque was a series of grouped vesicles. The entire lesion resembled a vaccination pox. *Also,* the right anterior cervical glands and nodes at the angle of the right jaw were enlarged and tender For a while it seemed that the lesions might be followed by a scar However local application of a weak solution of dalibour water followed by topical use of a 1 per cent scarlet red in zinc oxide ointment together with daily intramuscular injections of procaine penicillin G in oil (300 000 units) for three consecutive days, resulted in regeneration of the skin.

Wet dressings of aluminum acetate solution *(1 part to 10 parts of water) may be prescribed*

for the edema, or dalibour solution, 1 teaspoonful diluted with glass of cool water may be used. For the secondary infection that may follow 300,000 units of procaine penicillin G in aqueous suspension may be given intramuscularly for several days and the broad spectrum antibiotics may be prescribed topically

Wasps, Bees, Mosquitoes, Midges

Stings of wasps (Vespidae) bees (apes mellificae) mosquitoes (Culicidae) (Fig. 125) and midges (Chironomidae) are best treated by the application of weak solution of ammonia. A small quantity of 10 per cent ammonia water or a few drops of aromatic spirit of ammonia applied to the sting will usually counteract the pain and inflammatory reaction. Peroxide of hydrogen in full strength also is efficacious but less so than ammonia water Local applications of spirit of camphor in the form of wet dressings are comforting as well as antipruritic.

I am particularly fond of wet dressings of epsom salt (magnesium sulfate) in the proportion of 1 tablespoonful of the salt to 1 qt. of hot water After the salt is dissolved the solution should be made ice-cold and applied continuously for 15-20 minutes provided the child can tolerate the cold applications. Bites around the eye which cause considerable swelling of the lids are treated satisfactorily by means of cold compresses of bicarbonate of soda (1 teaspoonful to a glass of water) Frequent applications

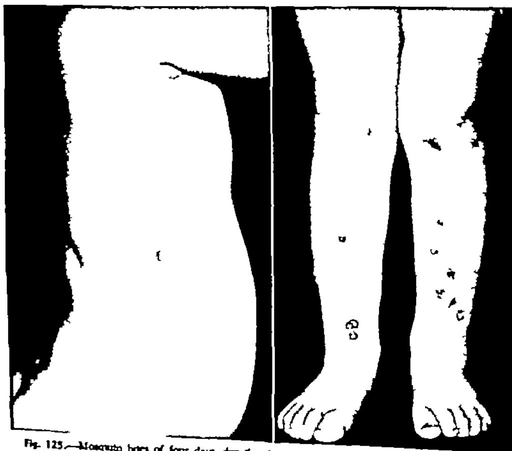


Fig. 125.—Mosquito bites of four days duration in small child. Similar lesions occurred on the upper extremities. Some lesions consisted of hemorrhagic crusts. Note the grouped papules, some in linear arrangement. Some of the lesions are surrounded by an edematous urticarial wheal.

of soothing lotions such as calamine are helpful.

When the *honey bee* stings it leaves its sting behind in the tissue This is better lifted or scraped out of the skin than pulled out. Here again hot applications of epsom salt are very useful for relieving the pain and reducing the swelling of the affected part. Adrenalin chloride (Epinephrine Solution U S P) 1 1000 may be indicated in small doses of 0 3 cc. (5 minims) or more for the shock and threatened collapse occasionally encountered.

Blister Beetles

There are many *species of blister beetles* The blistering effect is due to cantharidin. Usually the lesions result from crushing of the insect on the skin It is characterized by the appearance of a good sized tense bulla associated with considerable burning and itching at the site of the injury The affected area may be in an exposed region although parts covered by clothing also may be affected.

The active principle of the blister beetle may be removed by gently cleansing the parts with several layers of gauze saturated with benzene This is then followed by the use of soap and water Blisters should be opened and a broad spectrum antibiotic ointment or cream or 3 per cent ammoniated mercury ointment should be applied several times daily to prevent secondary infection.

Caterpillar Dermatitis

Caterpillar dermatitis occurs in New England states and usually results from the nettling hairs of the caterpillar of the brown-tailed moth. This condition is usually seasonal with most cases occurring during May and June. The nettling hairs may be deposited directly on the skin or they may be transferred through clothing upon which they are lodged Handling of cocoons is a common source of the dermatitis.

The symptoms come on within a period of 30 minutes after the patient has been in contact with the caterpillar Itching is usually the first symptom experienced and it is followed by the appearance of erythematous macules and wheals. The lesions as a rule are localized to the affected area and may persist for days or weeks. Nausea, vomiting and numbness of the part may be other complaints.

Treatment consists in destroying the contaminated clothing and the use of antipruritic and antiphlogistic topical remedies such as 0.5 to 1 per cent of phenol in calamine lotion.

Representative Prescription

℞

Butyl aminobenzoate (Butesin)	100 0
Benzyl alcohol	170 0
Anhydrous lanolin (melted)	20 0
Cornstarch	640 0
Sodium lauryl sulfonate	64 0

Misce et fiat

Signa. Wet skin and apply paste

Indication. Mosquitoes, fleas, antiphlogistic, antipruritic

(Fisher)

℞

Iodine	0.32
Saponated petrolatum	30 0

Misce et fiat

Signa. Apply

Indication. Mosquitoes, fleas, antiphlogistic

(Fisher)

See Formulary ℞ 5 antiphlogistic for acute stage (edema) 10 to which may be added 0.5 to 1 0 per cent phenol as antiphlogistic and antipruritic, 30 antiphlogistic 85 antiphlogistic and antipruritic.

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21

Systemic Diseases with Skin Manifestations

A NUMBER OF the diseases to be discussed in this chapter belong to the so-called "collagen diseases." That is to say that histopathologically they are characterized by fibrinoid degeneration of the collagen. Examples discussed in this chapter are lupus erythematosus, dermatomyositis, periarteritis nodosa and panniculitis. Scleroderma (Chapter 9) also belongs to the collagen diseases. Their etiology is unknown although undoubtedly many have common factors in their causation. While not specific remedies, the corticosteroids have been of great help to the dermatologist in modifying at least temporarily many of the clinical signs and symptoms.

For the sake of convenience, purpura and livedo reticularis also are discussed in this chapter. In both conditions, vascular changes are involved.

Lupus Erythematosus
(Seborrhea Congestiva)

The term "lupus," derived from the Latin word meaning wolf, was used originally to connote the destructive character of diseases that were thought at that time to be tuberculous. Lupus erythematosus is a superficial, acute or chronic inflammatory disorder of the skin characterized by maculopapular lesions and plaques, scales, follicular plugging and telangiectasis and terminating in atrophic scarring.

There are two main types of lupus erythematosus, discoid and acute disseminated. The discoid type, also known as the localized or fixed type, is characterized by chronicity. A generalized discoid type is sometimes seen and a subacute disseminated type also occurs.

The exact cause is unknown. Local irritation from sunburn, burns or insect bites may be contributory factors; the disease may have an allergic background, or the etiology may be multiple and based on a combination of toxic factors. The disease is uncommon in childhood and rare in infancy. Of recorded cases, 5 per cent occurred in children.

Clinical Picture.—Both acute and discoid forms of lupus erythematosus in children differ little, if any, in their clinical manifestations from the disease seen in adults.

ACUTE DISSEMINATED LUPUS ERYTHEMATOSUS.—This form, generally regarded as a uniformly fatal disease, is characterized by systemic involvement—a sepsis in the true sense in which viscera, heart, lungs, liver, kidneys and spleen also come to share in the acute process. The skin manifestations may be minimal or even absent. Less fulminating types have been known to undergo spontaneous remissions yet with recurrences. Death occurs usually during a relapse and usually within a year after the onset.

The eruption is first noticed upon the exposed areas of the skin and often, but not in every case, follows sunburn. The story elicited

usually runs as follows. After a severe or moderately severe sunburn which subsides in the course of a week or two a rash appears on the same areas of the skin The eruption spreads intensely upon adjacent areas. The areas of predilection are the exposed regions of the body: the cheeks, nose, forehead, ear lobes. Less frequently affected are the scalp fingers, hands toes feet and legs. The lips and oral mucosa not infrequently share in the inflammatory process. Examination reveals the skin to be red or violaceous and covered by a maculopapular eruption which is sometimes vesicular The lesions are surrounded by an erythematous base (Fig. 126 *A*) In its classical form, the clinical picture of the lesions on the face is a "butterfly" configuration consisting of sharply demarcated erythematous plaques symmetrically situated on the cheeks and joined by a crest of erythema over the bridge of the nose. Instead of the typical butterfly appearance or sometimes associated with it are found irregularly shaped erythematous macules maculopapules of roughened skin with sharply demarcated margins, at times pigmented and associated with ruptured and unruptured vesicles. These lesions are diffusely scattered on the face ear lobes and other exposed areas. Petechiae and ecchymotic areas are sometimes found on fingers and palms. The latter are associated with considerable edema of the hands feet, face and eyelids. Generalized adenopathy may occur Itching as a rule is mild or entirely absent except on the scalp where it may be severe. Older children sometimes complain of a burning sensation of the skin. The patient's complaints may closely simulate those of rheumatic fever Nausea anorexia fatigue, general malaise, migratory muscle pains and pains in the joints with a history of an intermittent low grade fever (100-101 F) are commonly present These symptoms may continue for weeks or months before the true nature of the underlying disease is discovered. They are frequently of the fulminating type characterized by acute glomerulonephritis. The blood sedimentation rate is rapid, the serum globulin increased. Other findings of clinical importance include a hypochromic anemia, *thrombopenia leukopenia* and the finding of the L.E. cell Dubois has reported three cases in children in which an acquired hemolytic anemia occurring in two of the three preceded the rash of lupus erythematosus disseminatus. Anemia, he points out, is one of the *classic features of the disease.* These symptoms are soon followed by progressive loss of weight.

Libman-Sachs syndrome a variant of subacute lupus erythematosus, is characterized by nonbacterial endocarditis with verrucous lesions upon the endocardium Clinically the condition is characterized by a continuous moderately elevated temperature and increasing anemia with erythematous and ecchymotic lesions resembling those of acute disseminated lupus erythematosus. This syndrome has nothing to do with rheumatic fever

DISCOID TYPE OF LUPUS ERYTHEMATOSUS — While this type is more common among young adults, it is occasionally seen in young girls at puberty but practically never in younger children. The disease usually affects the face although the ear lobes, neck hands and fingers also may be involved. In its classical form on the face, this benign type of lupus erythematosus is represented by the butterfly configuration or the "bat winged" lesions already described (Fig 126, *B C*) The wings appear as sharply marginated infiltrated plaques symmetrically situated on the cheeks and joined together across the bridge of the nose Individual lesions appear as discoid plaques of a bright red or violaceous color the center of the lesions being somewhat depressed with the border somewhat elevated, often telangiectatic On closer examination many lesions are found to be scaly: the scale however is superficial and on areas where the lesions have persisted for some time atrophic. Not uncommonly scarring may be seen on the external surfaces of the ear lobe and the face in fact, scars on the ear lobe should arouse suspicion that they are the result of lupus erythematosus. The scalp may show one or more areas of a cicatricial alopecia. Lesions may also be found on the borders of the lips and on the oral mucosa. Here again one finds the classical superficial adherent scale which, when removed, discloses the dilated conical follicle Telangiectasia and atrophic scarring, evidence of destructive pathologic process, with depigmentation may be seen. This type of lupus

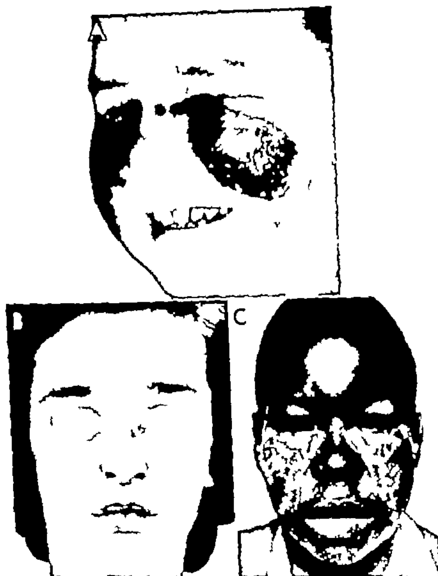


Fig. 126.—Lupus erythematosus. Note butterfly distribution. A shows an acute type. B and C show the discoid type. (A and C courtesy of Dr. Meyer L. Niedelman.)

erythematosus is sometimes followed by the acute disseminated type.

Diagnosis.—A history of direct exposure to the sun or a rash following sunburn is often helpful in diagnosis, but many instances occur without any such history. Clinically an erythematous eruption consisting of macules or plaques, particularly when scattered over the exposed areas of the skin and especially when conforming to the "butterfly" appearance, is very suggestive of acute *disseminated lupus erythematosus*. These signs together with the constitutional symptoms already described and *with fever*, a rapid blood sedimentation rate, leukopenia, hyperglobulinemia, constitute strong evidence *in favor* of disseminated lupus

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lem. Hence, early treatment is most important.

Prophylaxis and Treatment.—Foci of infection should be sought for and, when found, eradicated at the proper time. Persons subject to any form of lupus erythematosus should be cautioned against direct and indirect exposure to the sun and proper precautions should be taken to avoid it. Sun screens should be employed when the patient spends time outdoors and the adequate protection of the face by means of properly adjusted hoods should be insisted upon during the summer. Long-sleeved gloves should be worn to protect the hands and forearms.

Patients with either acute or subacute lupus erythematosus should be hospitalized immediately. Routine studies should include a complete blood count, blood studies for albumin and globulin ratio, sedimentation rate, urinalyses and a complete physical examination.

For the *acute fulminating type* of lupus erythematosus ACTH or cortisone should be administered promptly both for the remission of the disease and as a life-saving measure. Indeed ACTH and cortisone have revolutionized the therapy of lupus erythematosus. They produce a definite over-all improvement and they also bolster the patient against the stress of intercurrent disease. Nevertheless, the laboratory data will change little if any. Furthermore the disappearance of symptoms usually is only temporary and they may return even during treatment. On the other hand, in a few cases a remission may occur and remain as long as the patient is receiving maintenance doses. In the localized discoid type of lupus erythematosus, cortisone or ACTH has been less effective.

Every patient with acute disseminated lupus erythematosus should therefore be given the benefit of ACTH or cortisone with the hope that its use will be followed by a remission. A good plan is to initiate treatment with adequate dosage of ACTH intramuscularly and as improvement follows to reduce the dosage gradually substituting cortisone per os in its place. As improvement occurs, cortisone dosage should also be reduced to a maintenance dose, which of course varies in individual cases.

The following scheme might be followed:

1st day—ACTH 25 mg. intramuscularly every 6th hour (a total of 100 mg. in 24 hours).

With a return of the temperature to normal, ACTH is reduced as follows:

2nd day—total of 90 mg. within 24 hours.

3rd day—total of 80 mg. within 24 hours.

4th day—total of 75 mg. within 24 hours.

5th day—discontinue ACTH; start cortisone in dose of 200 mg. to 300 mg. daily by mouth.

6th day—100 to 200 mg. cortisone daily by mouth; taper the dose down to a maintenance dose of 50 mg. daily. Institute a salt-free diet during the treatment, with 1 Gm. of potassium chloride administered in the form of enteric coated capsules in dose of 1 capsule three times daily.

For the older child (at puberty) cortisone may be given in dose of 15 mg. by mouth every 6 hours until a remission occurs. The dose should then be reduced still further if possible.

For the *discoid type* of lupus erythematosus the following remedies have proved useful:

Bismuth Subsalicylate in Oil. 0.5-1.0 cc. intramuscularly administered once weekly for six weeks. After a rest period of several weeks, a second course of injections may be given.

Bistrimate Tablets, each 0.41 Gm. tablet contains the equivalent of 75 mg. of bismuth. Dose, 1 tablet two or three times daily.

Gold Sodium Thiosulfate: initial dosage of 10 mg. given intravenously or intramuscularly with a gradual increase of the dose to 25 mg. given every week or two. Routine blood count and urinalyses should be carried out during treatment.

Crude Liver Extract, 1-3 cc. given intramuscularly two or three times weekly for 6 weeks.

Tocopherol (Vitamin E), in dose of 50-100 mg. given once daily by mouth and continued for several weeks. Intramuscular injections in doses of 0.5 cc. once weekly for six weeks may be used instead.

Quinacrine Hydrochloride U.S.P. (Atabrine). The dose of Atabrine for the older child is variable and depends upon the age and weight. The following schedule of dosage may be followed for the older child: 1st day: 1 tablet, 50 mg. each, three times daily; 2nd day: 1 tablet, 50 mg. each twice daily; 3rd day: 1 tablet, 50 mg. each, once daily (as the maintenance dose). One

erythematosus. The finding of the L.E. cell (Fig. 127) in the bone marrow and of the lupus erythematosus phenomenon in the peripheral blood serve as confirmatory evidence.

The diagnosis of *chronic discoid lupus erythematosus* is based on the localized fixed lesions already described and an absence of constitutional symptoms. The cardinal points of the eruption are a superficial scale which when re-



Fig. 127—Lupus erythematosus. Bone marrow tissue shows a typical L.E. cell (By permission from Hill, Lee Forrest *J Pediat. 41 349 354* September 1952.)

moved leaves a dilated follicle (follicular plugging) telangiectasia and the presence of atrophic scars.

Differential Diagnosis.—The *acute dissem nated type* should be differentiated from ma multiforme, psoriasis, eczema vulgaris. The classical charr erythematosus (telangiectasia follicular plugging and atr butterfly configuration of cicatricial alopecia that differentiate it from e psoriasis in which tl scales are thinner weeping of lea

inent feature in eczema, is mild or absent. *Lupus vulgaris* can be ruled out when diascopic examination does not reveal apple jelly nodules and also by means of histopathologic study

The *chronic discoid type* should be differentiated from seborrheic dermatitis, lupus vulgaris, sarcoid and tertiary syphilis. Here again the classical characteristics are helpful. The follicular plugging dilated follicle and scarring will not be found in *seborrheic dermatitis*. Furthermore, in the latter the scale is yellowish and greasy and affects mostly the sebaceous areas. Diascopic examination will not reveal the apple jelly nodules typical of *lupus vulgaris* and there will also be less tissue destruction than in the latter but in difficult cases resort to biopsy may be needed. The clinical signs of lupus erythematosus are absent in *sarcoid* in which eosinophilia, adenopathy and osseous lesions may be found and also in *tertiary syphilis* in which a history of syphilis and a positive reaction to blood serologic test will be found.

Complications and Prognosis.—Bronchopneumonia is the most frequent terminal condition Glomerulonephritis follows next in frequency Other complications include endocarditis, pericarditis, pleuritis perisplenitis, perihepatitis, degenerative changes of the skin, necrosis of the lymph nodes, anemia and leukopenia.

Under certain circumstances the chronic discoid form may be followed by acute disseminated lupus erythematosus.

Acute and subacute disseminated lupus erythematosus are serious diseases with grave prognostic import Spontaneous cure has been reported in some instances but the disease is associated with a high mortality The usual duration from the time of onset of constitutional symptoms varies from 2½ months to 2 years. Remissions lasting from a few weeks to several months occur in more than 50 per cent of cases. years the use of the cor or combined with an frequently changed the disease.

lem. Hence, early treatment is most important.

Prophylaxis and Treatment.—Foci of infection should be sought for and, when found, eradicated at the proper time. Persons subject to any form of lupus erythematosus should be cautioned against direct and indirect exposure to the sun and proper precautions should be taken to avoid it. Sun screens should be employed when the patient spends time outdoors and the adequate protection of the face by means of properly adjusted hoods should be insisted upon during the summer. Long-sleeved gloves should be worn to protect the hands and forearms.

Patients with either acute or subacute lupus erythematosus should be hospitalized immediately. Routine studies should include a complete blood count, blood studies for albumin and globulin ratio, sedimentation rate, urinalyses and a complete physical examination.

For the *acute fulminating type* of lupus erythematosus ACTH or cortisone should be administered promptly both for the remission of the disease and as a life-saving measure. Indeed ACTH and cortisone have revolutionized the therapy of lupus erythematosus. They produce a definite over-all improvement and they also bolster the patient against the stress of intercurrent disease. Nevertheless, the laboratory data will change little if any. Furthermore, the disappearance of symptoms usually is only temporary and they may return even during treatment. On the other hand, in a few cases a remission may occur and remain as long as the patient is receiving maintenance doses. In the localized discoid type of lupus erythematosus, cortisone or ACTH has been less effective.

Every patient with acute disseminated lupus erythematosus should therefore be given the benefit of ACTH or cortisone with the hope that its use will be followed by a remission. A good plan is to initiate treatment with adequate dosage of ACTH intramuscularly and as improvement follows, to reduce the dosage gradually substituting cortisone *per os* in its place. As improvement occurs, cortisone dosage should also be reduced to a maintenance dose, which of course varies in individual cases.

The following scheme might be followed:

1st day—ACTH 25 mg. intramuscularly every 6th hour (a total of 100 mg. in 24 hours)

With a return of the temperature to normal, ACTH is reduced as follows:

2nd day—total of 90 mg. within 24 hours

3rd day—total of 80 mg. within 24 hours

4th day—total of 75 mg. within 24 hours

5th day—discontinue ACTH; start cortisone in dose of 200 mg. to 300 mg. daily by mouth.

6th day—100 to 200 mg. cortisone daily by mouth; taper the dose down to a maintenance dose of 50 mg. daily. Institute a salt-free diet during the treatment, with 1 Gm. of potassium chloride administered in the form of enteric coated capsules in dose of 1 capsule three times daily.

For the older child (at puberty) cortisone may be given in dose of 15 mg. by mouth every 6 hours until a remission occurs. The dose should then be reduced still further if possible.

For the *discoid type* of lupus erythematosus the following remedies have proved useful:

Bismuth Subsalicylate in Oil. 0.5-1.0 cc. intramuscularly administered once weekly for six weeks. After a rest period of several weeks, a second course of injections may be given.

Bistrimate Tablets, each 0.41 Gm. tablet contains the equivalent of 75 mg. of bismuth. Dose, 1 tablet two or three times daily.

Gold Sodium Thiosulfate: Initial dosage of 10 mg. given intravenously or intramuscularly with gradual increase of the dose to 25 mg. given every week or two. Routine blood count and urinalyses should be carried out during treatment.

Crude Liver Extract. 1-3 cc. given intramuscularly two or three times weekly for 6 weeks.

Tocopherol (Vitamin E). In dose of 50-100 mg. given once daily by mouth and continued for several weeks. Intramuscular injections in doses of 0.5 cc. once weekly for six weeks may be used instead.

Quinacrine Hydrochloride U.S.P. (Atabrine). The dose of Atabrine for the older child is variable and depends upon the age and weight. The following schedule of dosage may be followed for the older child. 1st day: 1 tablet, 50 mg. each, three times daily; 2nd day: 1 tablet, 50 mg. each, twice daily; 3rd day: 1 tablet, 50 mg. each, once daily (as the maintenance dose). One

tablet containing 50 mg. of Atabrine is continued after the third day over a period of several weeks until improvement occurs. It is not necessary to continue the therapy until a yellowish discoloration of the skin appears Routine blood counts and urinalyses should be carried out while the patient is under treatment

Chloroquine Phosphate U.S.P (Aralen Phosphate) is probably similar in its action to Atabrine. It has the advantage over Atabrine of not causing a yellowish discoloration of the skin. The older child may receive ½ tablet containing 250 mg. daily until improvement is seen.

TOPICAL THERAPY.—For small localized lesions solid carbon dioxide snow may be used once weekly for 10 seconds at a time.

See Formulary ℞ 16 for excessive crusting keratolytic 94-100 for sun screens.

Dermatomyositis
(Polymyositis)

Dermatomyositis is a generalized disease occasionally involving many organs of the body characterized primarily by a nonsuppurative inflammation of the striated musculature and usually accompanied by cutaneous lesions. The term in the strict sense should be restricted to instances in which the muscles are involved without cutaneous lesions The disease may be acute, subacute or chronic.

Etiology.—The exact cause is unknown although the disease is believed to be infectious. It is sometimes preceded by an acute tonsillitis and both streptococci and staphylococci have been suspected as responsible agents Parasitic and viral agents have also been incriminated but proof is lacking In infants, the disease occasionally follows an infectious disease such as measles. So far as can be determined the disease has no special seasonal incidence and it is probably as common in males as in females.

Dermatomyositis apparently is of rare occurrence in early childhood, particularly among children under 7 years. In 1950 one investigator was able to find only 19 instances of the disease in children under 7 years of age The youngest patient recorded in the literature was an infant aged 1½ years.

Clinical Picture.—The skin rash may be variable The clinical picture seen in younger children is similar to that in adults. The eruption as a rule begins on the cheeks and neck, frequently simulating lupus erythematosus. The rash may be either an erythema or an exanthem or it may even appear as a discoloration of the skin

An interesting feature, frequently noted, is a reddening of the eyelids or a redness or heliotrope hue surrounding the eyelids, sometimes followed by edema and an elevated temperature after one or two weeks. The edema sometimes extends to the nasal bridge, the malar areas and the upper lip In some cases the erythema has also involved the skin over the anterior chest and has been followed by a fine scaling. In milder cases, the lesions consist merely of induration over the malar prominences and/or periorbital edema. Photosensitivity of the facial lesions has been noted in some of these instances and in most child patients the skin lesions are present early in the disease Pigmentation of the skin may appear as a browning and, as the erythematous lesions disappear it may become localized or generalized The edema may be firm or it may pit on pressure The mucous membranes of the mouth may become involved and show reddening and edema.

The symptomatology is referable of course, to the musculature which bears the brunt of the process in this disease. A rather rapidly progressive weakness of the muscles is one of the outstanding symptoms. The muscles of the extremities neck and shoulder girdle are regularly and particularly affected Patients complain of an intense aching on movement the affected parts are very tender when palpated by the examining fingers. Walking after a while becomes difficult if not impossible. When the child is lifted from bed his head drops backward.

The disease is insidious in onset and may be present for weeks before medical advice is sought. When the onset is acute it is usually associated with extensive involvement and runs a rapidly fatal course. The most common of earliest symptoms are muscle tenderness, muscle weakness and fatigue Later the skin lesions appear However in some cases the muscle and cutaneous lesions appear simultaneously Any striated muscle may be affected to some degree. Weakness of the muscles involved may interfere with walking breathing and swallowing Weak

ness of the muscles of respiration and deglutition may cause or contribute to a fatal outcome. Diplopia also has been reported.

On examination, the muscles and subcutaneous tissue feel tender and boggy. In severe cases, where there is a great deal of muscular atrophy the muscles may appear as fibrous bands. The thickening of the joints results in various types of flexion. The overlying skin may appear tight and glossy or scaly leathery indurated and thickened (Fig. 1.8). The spleen and liver are of the skin and subcutaneous tissue especially of the malar regions and extremities. There are pain, weakness, atrophy and sometimes sclerosis of the upper and lower extremities. In childhood, the clinical picture is characterized by fever in the early stages.

Differential Diagnosis.—Disseminated lupus erythematosus, trichinosis, scleroderma, pellagra, neuritis and polymyositis must be considered in differential diagnosis.

The eruption, often periorbital, is more vio-

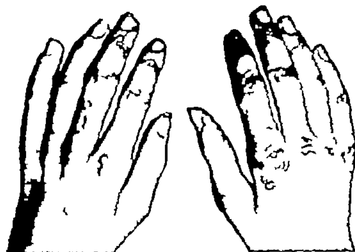


Fig. 128.—Dermatomyositis. Lesions on fingers and hands of child. (Courtesy of Dr. Meyer L. Niedelman.)

frequently found to be enlarged. Moderate fever remittent or intermittent, usually appears at the time the patient first *falls ill* and then generally subsides after two or three weeks when the disease is mild upon improvement. The sedimentation rate is increased at the height of *the illness* and may continue to be slightly elevated for some time following improvement. The creatine and creatinine outputs are usually increased although the creatinine output may be normal. As a rule, the albumin-globulin ratio remains undisturbed. Biopsy of the skin and muscles will confirm the diagnosis.

Diagnosis.—The three striking characteristics of this disease are myositis, dermatitis and pain. The skin rashes vary widely; they may be urticarial, telangiectatic, erysipeloid, purpuric or erythematous. There is usually a firm edema laceous than erythematous and is more indurated and less pronounced than the butterfly pattern of *disseminated lupus erythematosus*. Furthermore, leukopenia and renal involvement are absent in contrast to disseminated lupus erythematosus and, of course, the L.E. *cell* will not be found. The muscular weakness, pain and tenderness predominating in the early stages are in contrast to the skin involvement predominating in *scleroderma*, in which the muscle is unaffected. The facial and periorbital edema in dermatomyositis is more extensive and lasts longer than that of *trichinosis*. Furthermore, eosinophilia is a characteristic of the latter and skin testing with the Trichinella protein antigen will help in differential diagnosis. The gastro-intestinal symptoms, history of inade-

quate diet and obvious changes in the mucous membranes and the tongue that are found in *pellagra* are not found in dermatomyositis. The absence of nerve tenderness and of the reaction of degeneration serve to differentiate it from *neuritis* and *polymyositis*

Complications and Prognosis.—The most common complications are bronchopneumonia bronchitis nephritis, ulceration of the mucous membranes, respiratory paralysis and myocarditis Calcium deposits secondary to necrosis may occur late in the disease in muscle, fascia and subcutaneous tissue. When extensive such deposit has been included in the syndrome of calcinosis universalis Contractures varying from mild to moderate and limiting motion are found mostly in severe cases. These result in deformity and crippling and atrophy of the muscles.

The disease carries with it a grave prognosis Mortality is approximately 50 per cent. Some cases run a comparatively rapid (hyper acute) course others a subacute course, while in many the disease is chronic. In the chronic type the edema gradually subsides after several weeks. Atrophy discolored infiltration of the skin contractures and permanent disability may follow On the other hand recovery may be rapid, in some infants within a few weeks.

Treatment—Treatment is entirely symptomatic but seldom influences the course of the disease. However in those cases presumably due to infection the antibiotics and sulfonamides should be tried One case has been reported which responded to penicillin Foreign protein injections also may deserve trial. Results from ACTH have varied.

Acetylsalicylic acid may be ordered in doses of 0 065 Gm for each year of the child's age (usually not to exceed 0 32 Gm. at a single dose) *for its analgesic effect.* This dose should be repeated at four-hour intervals.

In a personal communication to the author Zarafonetis states that he employed para-amino-benzoic acid (PABA) in the treatment of dermatomyositis in children, beginning with the equivalent of 1 Gm. per 10 lb. of body weight per day Thus a 40 lb child may receive 4 Gm of PABA orally daily in divided doses. Often the amount is increased to perhaps 8-12 Gm. per day in older larger children. Therapy with PABA is continued indefinitely provided gradual improvement follows and until the patient's condition becomes static. He then interrupts the therapy and awaits a possible relapse If a recurrence appears, treatment with PABA is resumed and continued until the condition again becomes static. Zarafonetis believes that there is no cumulative toxicity from the continued use of PABA in the doses recommended. The main untoward effect in children as with adults is hypoglycemia, which might possibly develop if the food intake is extremely low *This complication is readily avoided* when the diet is adequate.

ORTHOPEDIC CARE.—Patients should be kept active in order to prevent fixation of the joints and muscle contractures. Rest in bed should be limited to patients entirely unable to be up and about. Orthopedic care should supplement physiotherapy (massage electrotherapy and proper gymnastic exercises) namely the use of traction, casts, splints and corrective operative procedures in order to prevent contractures and immobility of the joints This phase of treatment will be best carried out by a skilled orthopedist.

Periarteritis Nodosa

(Polyarteritis)

Periarteritis nodosa is a disease characterized by multiple, inflammatory destructive foci affecting the walls of the smaller arteries, arterioles and venules and eventuating in a high mortality Destructive phenomena in the blood vessels account for small aneurysms and the hemorrhage that follows. The disease may be acute, subacute or chronic.

Etiology—The disease is rare in infants under 1 year of age. About half the cases occur during the third and fourth decades of life. The disease appears to be four times as frequent in males as in females.

Periarteritis nodosa is caused by a variety of infectious agents. It also has a well established allergic basis in fact it has been shown that the offending antigen may be a foreign protein or some compound formed by conjugation with the sulfonamide drugs. A close relationship exists between periarteritis nodosa and certain cases of disseminated lupus erythematosus. This finding is based on the pathologic lesions of both diseases. Acute infections, particularly those in the upper respiratory tract are often found to precede the onset. The hemolytic streptococcus has been found most commonly responsible

next in frequency is the staphylococcus. Rheumatic fever has been associated with the disease commonly enough to suggest a possible relationship. Other responsible factors include the administration of the sulfonamides and the injection of horse serum.

Clinical Picture.—Skin manifestations occur only in about 25 per cent of cases. The skin and subcutaneous tissues are affected in three ways by rashes, edema or subcutaneous nodules. All of these may be present at the same time.

In some cases the rash is hemorrhagic (purpuric) in others it is erythematous or petechial and even ecchymotic. Occasionally the hemorrhagic manifestations progress to necrotic ulceration. Urticarial lesions, vesicles and bullae have been observed. The rashes are regarded as of toxic origin.

Edema has been observed in the majority of cases reported. At times it is limited to the face and eyelids, at other times to the hands and feet; often it is generalized over the entire body. The edema is considered to be of nephritic origin.

Subcutaneous nodules, the most characteristic finding, occur in about 25 per cent of cases. Often appearing in crops, they represent either thickenings in the wall of the blood vessels or actual sacculated aneurysms in the coats of the arteries. They are small, pea-sized or smaller masses and feel shotlike on palpation. They are often superficial and painless; occasionally they may be red and tender. Subcutaneous nodules are found particularly on the forearms, chest, legs, abdomen, face, back, fingers, scalp scrotum and tongue.

The symptoms include irregular fever weakness, prostration, anemia and tachycardia. Associated with these more general symptoms, notably those of sepsis, are symptoms due to widely scattered vascular changes in the body. The wide variations in this latter group depend almost entirely on the differences in the location of the pathologic process. An enlarged spleen and leukocytosis are often present. Eosinophilia, while not a constant finding, occurs with such frequency as to cause it to be regarded with importance. Many investigators attribute eosinophilia as evidence of hypersensitivity. On the other hand, leukopenia is also commonly seen. The coagulation time may be prolonged. The muscle pains have been mistaken sometimes for trichinosis. In other instances, the symptoms have simulated acute appendicitis. Pain in the voluntary muscles and along the peripheral nerves frequently occurs. Pain in the joints may assume an acuteness simulating acute rheumatic fever.

Diagnosis.—The classical features of the skin manifestations include the subcutaneous periarteritic nodules, purpura and gangrene. The constitutional symptoms, frequently bizarre, include fever which is indicative of sepsis and pain in the muscles, abdomen and joints. In many instances an absolute diagnosis can be made only by means of biopsy or at necropsy. The characteristic histopathologic changes show fibrinoid degeneration of the blood vessels.

Prognosis and Complications.—The syndrome is characterized by repeated attacks and exacerbations. It has been estimated that the disease results in a mortality well over 90 per cent. It may last a few weeks to half a year but seldom lasts more than one year.

Death may be caused by (1) hemorrhage due to rupture by aneurysm in a vital organ, (2) necrosis, or (3) an insufficient blood supply to vital organs, resulting from occlusion of the lumen of their arteries by thrombosis or intimal proliferation. Necrosis, ulceration and gangrene of the affected regions and members (fingers, toes, etc.) have also been reported.

Prophylaxis and Treatment.—Prophylactic treatment consists in preventing infections whenever possible. Antibiotic and sulfonamide therapy should be employed for infections.

There are no specific therapeutic measures. Treatment is symptomatic. ACTH and cortisone, because they are of temporary benefit, should be given a trial.

Temporary splinting should be employed to prevent lower limb contractures, particularly when prolonged bed-rest is indicated. Nicotinic acid has been suggested for the peripheral vascular ischemia in dosage of 10-20 mg. daily given orally.

TOPICAL THERAPY.—Antiphlogistics consisting of cold or warm wet dressings of Burow's solution (Aluminum Acetate Solution U.S.P.)

quate diet and obvious changes in the mucous membranes and the tongue that are found in *pellagra* are not found in dermatomyositis. The absence of nerve tenderness and of the reaction of *degeneration serve to differentiate it from neuritis* and *polymyositis*

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Etiology—The disease *is rare in infants* under 1 year of age. About half the cases occur during the third and fourth decades of life The disease appears to be four times as frequent in males as in females.

Periarteritis nodosa is caused by a variety of infectious agents. It also has a well established allergic basis, *in fact it has been shown that the* offending antigen may be a foreign protein or some compound formed by conjugation with the sulfonamide drugs. A close relationship exists between periarteritis nodosa and certain cases of disseminated *lupus* erythematosus. *This finding* is based on the pathologic lesions of both diseases. Acute infections, particularly those in the upper respiratory tract, are often found to precede the onset. The hemolytic streptococcus *has been found most commonly responsible*

ened tonsils. Hemorrhagic thrombocytopenia is often preceded by certain general infections, such as measles, tuberculosis syphilis, diphtheria, typhus fever pneumonia, pyelonephritis, septicemia, otitis and mastoiditis Other causes include drugs, especially those containing the benzene ring, which affects the bone marrow elements. Insect bites may also be causative. Thrombopenic purpura may be due to blood dyscrasias; e.g., aplastic anemia, leukemia and megaloblastic anemia. In the so-called "secondary purpuras associated with changes in the capillary walls (nonthrombopenic) infections again play an important etiologic part. Here too chemicals, avitaminoses and chronic disorders of the heart, kidneys and liver may be causative factors. Many cases of Schoenlein-Henoch purpura are known to be due to allergy Certain allergenic foods such as milk, wheat, egg and pork, have been incriminated. Five cases of purpura occurring in children following exposure to DDT have been reported. The purpuric manifestations were extensive and associated with marked thrombocytopenia in four cases. Recovery occurred promptly with change in the environment.

Clinical Picture.—A history of the child's bruising easily may frequently be elicited. The one cardinal sign, of course, is hemorrhage which varies from pinpoint hemorrhagic puncta (macules) (Fig. 129) to large ecchymoses. However the site, character and severity of the bleeding vary in individuals. Bleeding may occur from the nose or mouth, into the gums, under the skin or from the rectum, vagina or urinary tract. The peridental gingival margins have been observed to be the most frequent sites of hemorrhage in the mouth. The purpura may be associated with frank hemorrhage from the mucous membrane occurring both simultaneously with it or independently Upon inspection, both the upper and lower extremities may exhibit fine petechiae On the other hand, large hemorrhagic ecchymoses, single or multiple, may be seen. The hemorrhagic area is hard, indurated and generally localized, varying in size from a nut to an orange. The exposed areas of the body and those subject to trauma are usually involved. Different terms are used to describe the various degrees of purpura as judged by the size of the lesions. Thus "petechiae are purpuric lesions that vary in size from pinhead to dime. Round or oval macules they occur spontaneously The "vibices are streaked forms of purpuric spots. Ecchymoses" are larger patches of lesions. These are often extensive, irregular coin-shaped and may attain the size of the palm. "Ecchymomata or "hematomata are large flat, tumor like protrusions or elevations due to large hemorrhage. "Suffusions are large extravasations of blood.



Fig. 129.—Purpura following mosquito bites in boy 8 years of age. The closely packed reddish brown papules, from pinpoint to pinhead in size and discrete and confluent, were first noticed on thighs, dorsa of feet and ankles. There was mild pruritus.

The blood picture is characteristic in thrombocytopenic purpura. The bleeding time is prolonged, the clot retention is greatly delayed or

in 1 20 dilution or of epsom salt 1 oz. to 1 qt. of water are comforting as local measures for muscle and joint pains and also to relieve the edema.

Relapsing Febrile Nodular Nonsuppurative Panniculitis

(Weber-Christian Disease)

This is a syndrome of unknown etiology characterized by a relapsing febrile, nodular nonsuppurative inflammatory process with necrosis of the subcutaneous fat and at times of the internal fatty tissues also The exact cause is unknown. In general however it falls into two groups based on association with (1) bacterial infection and (2) drug sensitivity Focal infection tuberculosis and drugs, particularly iodides and bromides, are probably responsible factors. Focal infections in dental caries and in tonsils are thought to be chief sources Some investigators are of the opinion that the syndrome represents an allergic manifestation. It is rare in children

The eruption consists of cutaneous and subcutaneous, painless or tender nodules which generally appear in crops. The nodules may appear anywhere on the body but are found especially on the thighs and less frequently on the trunk. Usually the smaller nodules are painless and the larger are not painful but tender Swelling and purplish-red discoloration of the skin with moderate tenderness may be the first sign to attract attention Gradually the color fades and the nodular masses of fat disappear Then the overlying skin becomes depressed and sunken this change due to an atrophy of the subcutaneous fat is permanent. Still the hyperpigmentation may remain for a long time with perhaps a dimpling at the site of the lesion Several such courses may be experienced in the course of several months.

The symptomatology is variable and includes malaise and irritability especially on movement The fever usually of the intermittent type is probably caused by the eruption since it persists as long as the nodules are on the skin Leukopenia is frequently found. The diagnosis should be suspected when there are found crops of nodules showing central clearing and softening (saucerlike) together with fever and other constitutional symptoms

The following point should be remembered in differential diagnosis. *Subcutaneous fat necrosis* and *sclerema neonatorum* occur in the neonatal period whereas Weber-Christian disease is seen mostly in adults. The age of the patient serves to distinguish *lipodystrophy* due to insulin injection from Weber-Christian disease. There is no atrophy of fat and consequently the saucerlike depression of the lesions is absent in *erythema nodosum* Necrosis and ulcerations of the lesions occur in *erythema induratum* and the tuberculin reaction is positive. There is no atrophy of the fat in the *sarcoid of Darrier Roussy* Furthermore the histologic picture is entirely different from that seen in the Weber-Christian syndrome.

Treatment—There is no specific therapy Penicillin has been used with favorable results. Accordingly antibiotic therapy should be given a trial when infection is present. ACTH and cortisone and antihistaminics have been tried but without success. Salicylates should be ordered for their analgesic effect

See Formulary R 5 wet dressing.

Purpura

Purpura is an extravasation of blood into the skin and mucous membranes. According to Clement and Diamond the symptom complex of purpura is divisible into three major categories (1) The symptomatic or definitely secondary purpura is associated with a variety of recognizable disease entities. It may be either thrombopenic or nonthrombopenic. (2) The nonthrombopenic or vascular purpura has a probable basis in disturbance involving the capillaries alone. It is possibly a sensitization phenomenon of the type usually called anaphylactoid allergic or Schoenlein Henoch purpura. (3) The thrombopenic form of purpura hemorrhagica, because it is not associated with a recognized primary cause is therefore usually labeled idiopathic.

Etiology.—No age is exempt although purpura is not common during infancy Infection undoubtedly plays a considerable role in the etiology particularly focal infections such as those of purulent sinusitis dental caries and dis

Livedo Reticularis

Livedo reticularis is a local circulatory disorder of the skin characterized by a mottled, blotchy or reticular bluish discoloration. It can be classified in three categories (1) Cutis marmorata, a transitory mottling, unattended by any pathologic alteration in the peripheral circulatory system and the form most frequently seen in infants; (2) livedo reticularis idiopathica, which differs from the first in that the mottling is not transient but permanent, and (3) livedo reticularis symptomatica, with demonstrable inflammatory changes found in the skin and in or around the blood vessels. This condition is associated with other diseases affecting the superficial vascular bed. The commonest example of it is erythema ab igne.

Livedo reticularis generally occurs in infants and younger children, it is rare during middle age and extremely rare during senescence. It is in all probability congenital anomaly which may appear spontaneously or be brought about by an intercurrent disease such as tuberculosis or syphilis.

The clinical appearance is of a bluish or purplish mottling or marbling of the skin on exposure to cold air. The areas of predilection are the extremities although the condition may be more or less generalized. The reticulated pattern coincides with the anatomic arrangement of the blood vessels in the corium. Ordinarily the blotches may vary from a deep blue when the patient is in cold air to red or reddish purple when he is in warm air. Coldness of the skin is usually both subjective and objective. Again the surface temperature of the affected areas of the skin may be normal. There are no constitutional symptoms.

Angioma serpiginosum from which it should be differentiated, is characterized by vascular puncta, a tendency for the lesions to be grouped, the presence of circinate lesions and the peculiar manner in which the lesions spread, i.e., the occurrence of satellite lesions which coalesce later to form patches. In difficult cases a biopsy may be required to settle the diagnosis.

Livedo reticularis often disappears as the child grows older. On the other hand livedo reticularis idiopathica generally persists with variations regardless of the ordinary temperature of the skin. Livedo reticularis symptomatica also is persistent, its mottling being associated with some other diseases.

Lumbar sympathetic ganglionectomy is a justifiable procedure in cases of livedo reticularis in which (1) no definite etiologic factor can be found and (2) in which superficial gangrene is present.

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absent Coagulation time is normal. The hemoglobin is reduced and there is a corresponding reduction in the red blood cells Nutrition is usually good with perhaps only the usual slight pallor of the mucous membranes common to many children However in severe cases where there is a great loss in blood there is obvious pallor of the skin and weakness.

PURPURA SIMPLEX.—This is a mild type of the disease. It is characterized by the appearance of few or many petechiael lesions on the neck trunk, legs, buttocks, thighs and forearms. Running a course of two to three weeks, it may be followed by recurrences lasting years. It is sometimes accompanied by mild constitutional disturbances such as slight fever gastro-intestinal derangement and pains in the joints.

PURPURA RHEUMATICA (peliosis rheumatica Schoenlein's disease) —Regarded by many as an anaphylactoid type of reaction purpura rheumatica is characterized by a multiform rash and arthritis Urticarial lesions are frequently seen. There is often a moderate elevation of temperature This type improves in about a month but recurrences are common. Frequently it is regarded as a variant of erythema multiforme.

HENOCH'S PURPURA.—Henoch's purpura is particularly common among children. It combines the symptoms of purpura rheumatica with abdominal symptoms (diarrhea vomiting colicky pains blood in stools) It may continue for months or years and has sometimes been mistaken for appendicitis or intussusception.

PURPURA FULMINANS.—This is a very rare and very acute type of Henoch's purpura with death occurring in one or two days. It is characterized by the sudden appearance of rapidly progressive symmetrical subcutaneous ecchymoses accompanied by high fever and intense constitutional symptoms The fulminating purpura, which may be preceded by scarlet fever appears suddenly in the second to the fourth week of that disease. It may follow other infectious diseases also but often the predisposing cause is unknown The prognosis is almost always grave. In a report of a study of 100 patients only 7 recovered. In two cases recovery following amputation of the severely involved extremity and in 2 cases it followed treatment with methionine

Diagnosis.—Diagnosis is based on the clinical evidence of hemorrhage (petechiae to ecchymoses) a low platelet count, prolonged bleeding time and delayed retraction of the clot. In thrombocytopenia there are no significant changes in the blood except anemia, which is secondary to hemorrhage in some patients. Purpura should be differentiated from erythema, acute leukemia, insect bites and drug rash.

Complications and Prognosis.—The most serious single complication of thrombocytopenic purpura is cerebral hemorrhage. Severe hemorrhage from the nose, bowels, bladder or vagina may prove fatal. Secondary anemia is the rule in the milder types and severe anemia where there has been a great loss of blood. Fatalities have been reported from hemorrhage in the brain and into the adrenals. Neuromuscular complications due to diffuse hemorrhages in and around the peripheral trunks and flexures supplying the extremities have been reported. In purpura rheumatica (rarely seen in children) albuminuria, endocarditis and pericarditis have ensued Spontaneous remission occurs in a large percentage of cases. Blood transfusions often accelerate remission as also does splenectomy

Prophylaxis and Treatment.—In children showing unusual recurrence of bruises, a tendency to nosebleed or in whom trauma is followed by purpura complete routine blood count and bleeding and coagulation time determinations should be performed.

Corticotropin (ACTH) and cortisone have been used by some clinicians with unusually good effects. Transfusion is a temporary measure. Repeated transfusion with relatively small amounts of whole blood or citrated blood tend to arrest hemorrhage and cause a return of the platelets to a normal level. Splenectomy in children in view of the decreased mortality from this ailment in acute cases, must still be regarded as a dangerous procedure. In any case splenectomy should never be undertaken in the presence of acute purpura because it may be followed by fatal hemorrhage. Splenectomy in children should probably be reserved for cases of uncontrollable bleeding and for the chronic occurrence of purpura. The indication for splenectomy is excessive fulminating bleeding from the mucous membrane Its chief value lies in the chronic type of purpura.

of vision, xerophthalmia or keratomalacia may also be present as may also eczema of the eye lids, nose and lips. There may be a delayed healing of wounds. Itching is a frequent complaint and there is often an absence of visible sweating.

Diagnosis is based on the clinical signs and symptoms, a history of vitamin A deficiency dark room adaptation tests and a blood serum vitamin A level of 20 μgm. per 100 ml. or lower Normal level in well nourished infants and children is 40 μgm., but signs of avitaminosis appear only *after* several months with a subnormal blood level.

Prevention consists in the routine use of either natural vitamin A in oil or the water miscible vitamin A during infancy and childhood. Therapeutic doses should be at least three times the minimum daily requirements of the vitamin, but *in infants not in excess of* 200,000 units a day and the dosage should be reduced to the minimum requirements as soon as improvement is noted lest hypervitaminosis A occur

The minimum daily requirements of vitamin A are 1500 units for infants, 3000 units for children and 4000 units for adults.

Hypervitaminosis A

It is believed that in children hypervitaminosis A occurs chiefly because of overdosage. The cutaneous manifestations resemble in many respects those of *hypovitaminosis* A and *hypothyroidism* and appear afte the administration of *daily doses of several hundred thousand units for* month or months. The cutaneous manifestations are onychorrhexis with soft brittle nails, focal alopecia of the scalp fissuring at the angles of the mouth, Riehl type of chloasma-like pigmentation of the face and neck, follicular keratosis of the extremities and a dry pruritic maculopapular rash *in* association with anorexia, irritability weight loss, menstrual abnormalities and *tenderness* over the long bones as a result of periostitis It has been reported also that vitamin A hypervitaminosis produces transitory acute hydrocephalus

Diagnosis is established by eliciting history of vitamin A overdosage, the symptoms and signs, -ray evidence nd a high vitamin A blood level.

Vitamin B_2 (Riboflavin Lactoflavin) Deficiency

Vitamin B_2 deficiency manifests itself by a condition known as ariboflavinosis, characterized by a red, glazed condition of the skin and lips. The lips are frequently fissured and crusted, especially *at the corners of the mouth* (cheilosis) The commissures of the mouth present a sodden appearance with a heaping up of the epithelium and cracking (angular stomatitis) (Fig. 130) The nostrils and the angles of the palpebral fissures may show similar changes. Comedo formation may be seen around the nasolabial folds and on the forehead with fine greasy desquamating scales (seborrhea) Frequently there is also an erosion around the eye and the skin of the nose, with the latter often appearing as "sharkskin. The tongue may be a magenta color Patients complain of burning sensation and excessive dryness of the eyes, itching and photophobia. The conjunctiva may show severe redness.



Fig. 130.—Vitamin B_2 deficiency (ariboflavinosis) Note the maceration and fissuring of the angles of the mouth and group of pinhead sized papules at the right commissure. (Courtesy f Dr Alfred B. Falk.)

The recommended intake of riboflavin for infants is 0 6 mg. daily The allowance increases to –5 mg. daily for adolescent boys and 2.0 mg. for adolescent girls. The therapeutic dose is 2.0 and 10.0 mg. daily depending upon the severity of the deficiency No side effects have been noted on the clinical administration of relatively large doses. *Methyl riboflavin may be adminis-*

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Disorders of Metabolism

IN THIS INTERESTING group of disorders, a disturbed metabolism produces clinical manifestations on the skin that in some instances are so typical as to constitute an early index to an underlying systemic disorder. In other instances the skin manifestations are produced by *a nutritional defect or imbalance that can be* corrected by dietary regulation. Still others, such as sporadic cretinism and myxedema, are of endocrinologic origin. Discussed in this chapter are disorders of vitamin, calcium, lipid and protein-carbohydrate metabolism.

Vitamin Metabolism

Vitamin A Deficiency

Reports on the incidence of vitamin A deficiency vary but there is evidence that it occurs most frequently in children of the low income group. It is seen also in infants with cystic fibrosis of the pancreas, in which the avitaminosis results from poor tolerance and absorption of the vitamin.

The lesions are composed of horny papules formed by keratotic plugs projecting from hair follicles and frequently containing a broken-off hair or a coiled unerupted hair. The skin changes in infants may consist of a dry, shriveled atrophic skin and an increased liability to diaper rash and impetigo. In older children the skin resembles an exaggerated state of "goose skin." Later the changes are associated with a dry, often furfuraceous skin, a true xerosis with pruritus.

Two types of follicular lesions may be seen. (1) Aggregations of dry, hard, dirty slaty-brown conical papules, each containing a central intrafollicular keratotic plug. The plugs, when they fall or are pulled out, leave small craters that form a "nutmeg grater" skin. The lesions are distributed symmetrically on the anterolateral aspects of the thighs, the posterolateral aspects of the upper arm and forearms, the shoulders, back, abdomen and buttocks and sometimes the neck and face. (2) Follicles, more commonly found on the face, which have become occluded, are hemispherical in contour, a few millimeters in diameter, generally pigmented and covered by a loosely adherent scale, resembling comedones but differing from acne in being dry and nonsuppurative. This condition has been compared to the skin of a toad, hence the name "phrynoderma" for severe cases. Lesions over the ankles, knuckles and heels may consist of warty hyperkeratotic plaques. The nail may become striated and brittle.

The manifestations described may occur independently or be associated with manifestations of vitamin A deficiency in other organs. Thus the conjunctiva may appear dry (xerosis) and shiny triangular spots may be found on both sides of the cornea consisting of dried epithelium with a loss of lustre and with white striated sprinkled areas (Bitot's spots). In extreme cases eye symptoms such as night blindness, dimness

fers common complaints in older children.

The three clinical stages of the cutaneous manifestations of pellagra in children are (1) hyperemia, (2) desquamation, and (3) fissures. In the first stage, the erythema appears *suddenly* on exposed parts of the body and often it is attributed to sunburn. Fingers and dorsal aspects of the hands up to the wrists may be involved in a gauntlet-like pattern. The erythema is always symmetrical and sharply demarcated and the skin appears considerably thickened. The face and posterior aspects of the neck also show hyperemia. Hyperpigmentation and dermatitis occurring on the anterior area of the neck and known as "Casal's collar" may extend over the sternum. Sometimes the dermatitis may involve the greater portion of the skin surface.

The erythema persists for weeks or months and then is followed by the second stage desquamation. After peeling, the affected parts remain hyperpigmented, especially in the Negro. Later the affected skin may appear thickened and leathery and be the site of numerous vesicles and bullae. In long-standing cases the skin may become atrophic, especially around the eyes, when ectropion may ensue.

In the third stage, painful fissures and ulcerations may occur around the *mucous membranes* of mouth and anus. Fissures of the commissures of the mouth are common; sometimes aphthous ulcers occur on the mucous membrane. The earliest symptom diagnostic of pellagra, but not one that causes children to complain or mothers to seek medical advice, is a swelling and reddening of the margin of the tongue that later extends until the tongue is fiery red in color.

The eruption tends to be worse in the summer, to improve or disappear *during* winter and to recur in the spring. Nausea, vomiting, abdominal distention and mental disturbance ranging from apprehension to mania frequently are seen. Diarrhea is a symptom often reported and the stools sometimes contain blood.

Search should always be made for a gastrointestinal disturbance such as stenosis or colitis that might be behind the nutritional deficiency producing the symptom.

In the classical case diagnosis is simple being based on the clinical manifestations and dietary history already described. It may be differentiated from *atopic dermatitis* by the lack of or only mild itching, the line of demarcation and the greater degree of pigmentation in the late stages. It may be difficult to distinguish pellagra from *lupus erythematosus* without histopathologic study although *follicular plugging* of the lesions will of course rule it out. Histopathologic study also may be required to differentiate pellagra from *erythema multiforme* except in cases of the latter in which the lesions occur on unexposed parts of the body.

Complications reported include tachycardia and hypertension, hypochromic anemia, osteoporosis, *photophobia* and chronic *conjunctivitis* or blepharitis suggestive of xerophthalmia. Rickets, nutritional edema, beriberi and scurvy tetany and severe nutritional edema also have been reported.

Improvement of milder cases takes place when the diet is improved with an adequate intake of meat and vegetables. It should be supplemented with nicotinic acid 10 mg. for infants, 25 mg. for older children, given three or more times daily. In more severe cases this dose should be increased and it may be given parenterally in dosage of 1.5 mg. per kg. of body weight per day. Or 200 mg. of niacin may be given daily in four divided doses. In most cases 2 to 4 Gm. of brewer's yeast three times daily produces rapid improvement. Whatever the treatment, riboflavin also should be given in the amount of 200 units per 100 calories consumed but in a minimum amount of 400 units per day. Iron by mouth and liver by mouth or by injection as well as blood transfusions also may be indicated.

Calcium Metabolism

Calcinosis Cutis

In calcinosis cutis there is an abnormal deposition of calcium salts in the skin and subcutaneous tissue forming tumors and plaques. It is rare.

The exact cause is unknown. It may appear in association with other conditions (e.g., dermatomyositis, scleroderma and Raynaud's disease) or independently and *at any age*. Various causes have been advanced regarding etiology

tered orally or parenterally with equal effectiveness and without side effects.

Vitamin C Deficiency

Scurvy results from a deficiency of vitamin C but nowadays because of improvements in the diet during pregnancy which supply ascorbic acid to the developing fetus, it is rare in infancy

One of the earliest signs is a follicular hyper keratosis seen over the calves and buttocks Pur pura (petechiae) may be found caused by a lowering of capillary resistance. In severer cases, ecchymoses may appear on the skin or as subcutaneous hemorrhages, even in the muscles However skin hemorrhages are seen most often in adults, not in infants. Hemorrhages may be found also on the lids and in the eyeballs, causing exophthalmos. The skin in scurvy presents a dry scaly rough and dirty yellowish color The gums are swollen (gingivitis) and hemor rhage in the gums may appear as a purplish-black discoloration. The latter is found only after the teeth have erupted. The teeth are often shed. There may be a low-grade fever or the condition may be entirely afebrile. Secondary anemia is not infrequently found in long-standing cases and edema over the affected limb can also be seen.

Pain the most constant presenting symptom is attributable to subperiosteal hemorrhage In an acute case an infant may suddenly begin to cry on being handled, particularly when the legs are touched, and may even scream when he is approached The legs, which often are swollen are held in a position of flexion and abduction

Diagnosis depends on obtaining a history of a diet deficient in vitamin C upon the clinical manifestations and upon the finding of areas of rarefaction on examination of the long bones. The symptoms respond promptly to therapy with vitamin C One of the earliest signs is the microscopic appearance of red blood cells in the urine or of blood in the stools. Result of the tourniquet test for capillary fragility is positive The normal vitamin C content of the blood for infants and children (blood plasma) is 0 7 1 4 mg per cent.

For prophylaxis, vitamin C supplies should be supplemented during infancy with _ oz. of orange juice daily especially in infants fed pasteurized or boiled cow s milk. Breast fed infants require no supplements of vitamin C provided the mother herself is taking a proper amount. Observations have shown that orange juice is preferable to pure ascorbic acid in the treatment of scurvy The daily therapeutic dose totaling 4 to 6 oz. may be administered in two or three divided doses diluted with an equal amount of water If orange juice is not tolerated, synthetic vitamin C may be given in quantities up to 50 mg. a day Or 100 mg. of ascorbic acid may be given three times daily although as little as 100 mg. may be administered daily or given intravenously This antiscorbutic vitamin should be administered at the therapeutic level for three or four weeks before being reduced to the prophylactic dose. Improvement is rapid.

Recommended levels of intake for children increase through childhood to 80 to 100 mg. daily between the ages of 13 and 20 years.

Pellagra

The word "pellagra is derived from the Latin "pellis, meaning skin and the Greek agra meaning a seizure. The condition is a syndrome resulting mainly from a deficiency in the supply or utilization of the component of the vitamin B complex known as niacin or nicotinic acid In the United States it occurs chiefly in the South in families subsisting on deficient diets that are sometimes comprised mainly of corn bread, fat meat, beans or potatoes. Where corn is the staple diet there is a tendency for pellagra to occur possibly caused by a deficiency of tryptophane, which apparently is necessary for the synthesis of niacin. It may be caused also by gastro-intestinal disturbances such as congenital stenosis of the intestines or colitis. It affects both sexes indiscriminately Most cases occur after the age of 5 years.

In children, in most instances the skin manifestations are among the most marked signs. In older children the hands and feet are most often affected in infants the rash frequently appears first on the face, either over the nose or about the corners of the mouth. The neck also is frequently affected in children. Itching is mild or absent but pain and burning sensations are

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In children in most instances the skin manifestations are among the most marked signs. In older children the hands and feet are most often affected, in infants the rash frequently appears first on the face either over the nose or about the corners of the mouth The neck also is frequently affected in children. Itching is mild or absent but pain and burning sensations are

and lower extremities, fingers, elbows, knees, shoulders and buttocks, and it is in these areas that the greatest number of lime deposits may be found. In contrast, the trunk, face and scalp are spared. There may be limitation of motion, especially when lesions occur around joints, and deformity.

Affected children are pale, undernourished and anemic. The disease, which is progressive, is characterized by periods of exacerbations and remissions. Laboratory studies are essentially normal for calcium and phosphorus and phosphatase. The lesions are painless early in the disease, but later when the calcareous deposits are closer to the skin surface, considerable pain and tenderness may be experienced. Roentgenologic studies are characteristic and show the deposits of calcium.

The diagnosis of calcinosis is made by elimination of other conditions that also may be responsible for abnormal calcification. It should be suspected in any case in which stiffness of the joints and contractures develop. The demonstration on radiologic examination of calcium deposits characteristically distributed at the point of greatest trauma is of great diagnostic assistance.

Discharging sinuses incident to the extrusion of calcium deposits are common, as also are ulceration, secondary infection and septicemia.

The outlook in *calcinosis circumscripta* is very good, with gradual resorption the rule. In *calcinosis universalis* the prognosis is serious, since the disease is usually incapacitating and frequently terminates f tally. Cosmetic blemishes may result from ugly scars left by the disease.

Various methods have been tried to aid the absorption of the calcium deposits in the tissues. A "cure" has been reported from the use of a ketogenic diet. Disodium phosphate has been employed to reduce the absorption of calcium from the gastro-intestinal tract. Thus, because of the negative balance created, the bony structures utilize the calcium deposited in the skin to produce bone. A negative calcium balance has been produced also through the use of ammonium chloride to lower the blood calcium and increase the excretion of calcium in the urine. Because vitamin D increases the absorption of calcium from the gastro-intestinal tract, still another method consists in the use of a low calcium and a low vitamin D diet.

Antibiotic therapy is indicated for sepsis and secondary infection. Painful lesions are best treated with acetylsalicylic acid given per os.

Surgical incision and drainage are indicated when calcified nodules cause pain or interfere with motion of the parts. Persistent ulcers are best treated by curettage. Local application of astringent and antiphlogistic remedies are at times helpful. Hematinics, vitamins and a well balanced diet are essential as adjuvants. An orthopedist should be consulted, especially for disability and deformity of the joints.

Lipid Metabolism

The term "lipoidoses" has been applied to a group of diseases in which the lesions, because of a local or generalized disturbance of the lipid metabolism, contain lipid substances (Lever). The term "xanthomatosis" is also used to describe such diseases. The skin lesions are only part of the clinical picture and viscera also share in the disturbed lipid metabolism. Discussed in this section are xanthoma tuberosum multiplex, xanthoma disseminatum, nevoxantho-endothelioma, congenital xanthoma, Gaucher's disease, Hand-Schüller-Christian disease, Letterer-Siwe disease, eosinophilic granuloma, Niemann-Pick's disease and necrobiosis lipoidica.

Lipid metabolism is in some manner involved also in another disease, lipodystrophy discussed in this section.

Xanthoma Tuberosum Multiplex

Xanthoma tuberosum multiplex may occur at any age. The disease is familial and is based on an inherited hypercholesteremia which is the primary disturbance. Several members of the same family while showing no clinical evidence of xanthomatosis, frequently demonstrate a hypercholesteremia.

The lesions (Fig. 132) consist of papules, infiltrated plaques and nodules varying in size from pinhead to lima bean or even as large as plum. The color varies from chamois to bright golden yellow or it may be light red. The yel-

Among them are a breakdown of fat as the result of trauma or of too rapid weight loss a disturbance in the vascular supply· disturbance of the fat metabolism of the epidermal cells secondary deposition of lime salt disturbance in calcium and phosphorus metabolism and a lipolytic ferment in the subcutaneous tissue. There are two types recognized calcinosis circumscripta and calcinosis universalis

Calcinosis circumscripta is seen in children



Fig 131 —Calcinosis cutis in a boy 14 years of age. The protuberances are calcium tumors. (By permission from Maloney E. R., and Bloom D Arch Dermat. & Syph. 23 245 Feb 1931)

but it is preponderantly a disease of middle age. The clinical picture is generally clear-cut. Sometimes the dermatosis is preceded by an acute febrile illness with muscular weakness following. The calcium deposits are as a rule symmetrical and affect the extremities exclusively particularly the upper extremities and fingers (sclerodactylia) They are usually found in the soft tissues about the joints, but not in the joint or joint capsule The essential feature consists of a nodule or nodules under the skin, painless at first and partially movable (Fig. 131) In children the nodules may be discovered quite accidentally by the mother In the more extensive types the child may be unable to straighten his arms or to bend over On the other hand, he may experience difficulty in walking or in opening his jaw or in rotating his head or in moving other joints. Examination by palpation discloses numerous firm discrete nodules that may be scattered over the body Occasionally calcinosis appears as elevated yellowish ridges over the elbows and knees.

Frequently an acute respiratory infection precedes the onset. Later the overlying tissue becomes inflamed irritated and tender and finally breaks down discharging a purulent chalky material containing calcium carbonate and calcium phosphate. The ulcers produced are deep and painful they heal spontaneously but leave ugly scars. Lesions about the joints may cause considerable limitation of motion, but atrophy is rare

Calcinosis universalis is more frequently seen in children and young adults than in middle and advanced ages. Its clinical manifestations are much more severe than those of calcinosis circumscripta since they affect the deeper tissues, tendons and nerves. The earliest symptom is frequently a soreness or tenderness of localized areas of the skin Examination at this stage as a rule reveals multiple discrete subcutaneous nodules, stony-hard to palpation differing greatly in size and irregular in shape but tending on the whole to be flat and to form plaques rather than solid masses as extension and aggregation take place When calcium deposition occurs around the joints, it is extensive and is generally followed by atrophy of the muscles. After a while the skin over the more superficial deposits becomes irritated red and inflamed as a rule, painful ulceration follows. All stages may be seen together the small, hard, superficial movable calcium nodules, the deeper hard plaques, the indolent ulcers with their characteristic creamy chalk like deposits, and extensive hard scars, the latter marking the sites of the end result of the inflammatory process.

Secondary infection and sepsis are a common finding. The distribution of these lesions is characteristic. They occur more abundantly on areas subjected to greatest trauma i.e. upper

Xanthoma Disseminatum

In this variety the lesions consist of innumerable, closely-packed, fine, red to brownish-red papules, generally capped by greasy scales or crusts. As the name indicates, the papules may be widely distributed. Favorite sites include the scalp face, axillae, trunk and the flexural areas of the joints. Lesions have also been known to occur on the mucous membranes of the mouth, pharynx and larynx. On the skin the appearance of the lesions has been likened to seborrheic dermatitis and keratosis follicularis (Darier's disease). Petechiae have been observed, also an associated xanthelasma. This type of xanthomatosis, in contrast to tuberosum multiplex, is nonfamilial and is seldom accompanied by *hypercholesterinemia*.

Congenital Xanthoma

In congenital xanthoma, at the time of birth or soon thereafter there are found elevated, globular yellowish, brownish or somewhat violaceous xanthomatous lesions of either hard or a soft consistency. In distribution the lesions, not differing from other lesions seen in xanthoma tuberosum, are found on the elbows, knees, shoulders and trunk.

Gaucher's Disease

Gaucher's disease is reticuloendotheliosis of uncommon occurrence characterized by enlargement of the liver and spleen. The lipoid deposit in this disease is kerasin.

Abnormal pigmentation appears with greater frequency in Gaucher's disease than in any other lipoidosis. It occurs on the face and it may also be seen on the legs. It has been described as very peculiar stripe-like pigmentation of the lower legs which is characteristic. The pigmentation is due to melanin. It is not found in all cases and it occurs rarely in children under the age of 10 years. It may assume different forms but the most common is a brownish-tan pigmentation or chloasma-uterinum-like patches on the exposed parts of the body.

Rarely the mucous membranes of the mouth also may be pigmented. There is a tendency for patients to bruise easily. Bleeding from the gums is not uncommon and ecchymoses may be seen early in the course of the disease. In the eyes wedge-shaped, brownish thickenings of the conjunctivae are characteristic. They resemble pingueculae extending from the corneal margin to the apices at the inner and outer canthi with the base of the triangle toward the cornea and the apices toward the canthi. Some investigators regard them as pathognomonic of Gaucher disease.

A diagnosis of Gaucher's disease cannot be made with any degree of certainty from the skin pigmentation alone. When, however pigmentation is associated with a brownish thickening of the conjunctivae and with bone changes and an enlarged spleen, the diagnosis becomes justified.

Hand-Schüller-Christian Disease (Idiopathic Xanthomatosis)

The chronic lipophagic form occurs mostly in children and young adults with the greatest incidence in the first ten years. Although not familial it is often hereditary. Chronic lipoidosis involves the spleen, liver and bone marrow.

The clinical features are variable, with the signs and symptoms depending on the areas, structures and organs affected by the granulomatous lesions. Schüller regarded the multiple skin lesions (Fig. 133) diabetes insipidus and exophthalmos as pathognomonic of the disorder. However recent reports in the literature disclose the fact that this clinical triad may be entirely absent.

Hand in his original case report described a bronzed, dried skin, the skin of the abdomen was covered with petechiae and an eruption something like scabies. Later the petechiae faded but the purpuric spots increased in number and an elevated, dull red, macular rash appeared all over the body and on the extremities while the feet were edematous.

Symmetrical brownish pigmentation, especially in reticular patterns on the lower extremities, has been observed. *Purpuric* tendencies are not uncommon. Some patients show erythema and eczematized lesions or reddish brown



Fig 132.—Xanthoma tuberosum. Note the rounded multiple nodules several discrete and other conglomerate. The chamois-skin color is not always present (Courtesy of Dr John C. Belisario. Photography by Mr Woodward Smith, Department of Artistry University of Sydney)

lowish color of the lesions is the striking feature that arouses the suspicion that the condition is xanthoma Often, however the fresh papular lesions are bright red owing to the abundant vascularization of the infantile skin but under diascopic pressure the reddish color disappears and shows the characteristic yellow Several smaller lesions may coalesce into lobulated masses. The lesions themselves may appear either soft or hard, while others have a hard keloid-like character Some smaller lesions appear suddenly but generally they evolute slowly and then remain fixed in the skin The mucous membrane and tendon sheaths also may share in the process. The lesions are symmetrically distributed The areas of predilection are the shoulders, elbows, knees finger joints, ankles palms, buttocks and even the scalp and face in *some children. Smaller and larger lesions may* be found over the entire trunk. Trauma inflicted by rubbing or injection may serve to precipitate new lesions. Linear yellowish streaks may at times be observed in the creases of the joints as well as on the palms and soles. The entire skin may show a lemon tinge (xanthochromia) but this finding is inconstant. Itching is seldom troublesome and there are no other subjective symptoms Lesions of xanthoma disseminatum may be found associated with xanthoma tuberosum. The former lesions are generally *scattered over the trunk or elsewhere.*

The absence of urtication (Darier's sign) will serve to differentiate xanthoma from *urticaria pigmentosum* and in difficult cases biopsy may be necessary

In juvenile xanthoma the mitral valve and myocardium are frequently found involved, the coronary arteries are also found to be involved at postmortem examination Many members of xanthomatous families acquire arterial disease and among them deaths from coronary disease at an early age have been recorded.

The condition is usually lifelong although *sometimes the lesions become smaller* and complete involution has been reported.

A strict vegetable diet, with all animal fats eliminated is often helpful in reducing the blood lipids. Insulin may be tried The lesions if not too extensive may be destroyed by galvanocauterization or they may be removed surgically

cyte (foam cell) on biopsy is indubitable proof.

Complications depend on the sites of the granulomatous infiltration. Dystrophia adiposogenitalis, dwarfism, deafness, dyspnea, spontaneous fractures in the long bone, headaches, localized scalp tenderness, enlarged cervical glands, facial paralysis, hemiatrophy of the tongue and restricted mental development all have been reported.

Prognosis depends on the number and extent of the visceral and nervous lesions. In very young children, the outlook is graver since the disease then follows an acute course and ends fatally. The older the child, the more favorable the outlook. According to some authorities there is a 30 per cent mortality. However spontaneous remissions have occurred.

A high protein, high carbohydrate, low fat diet has been suggested by Sussman. He recommends 10 units of soluble insulin daily to stimulate the appetite. Pitressin has been employed to control polyuria. Roentgen-ray therapy has improved polyuria even better than injections of pitressin.

Letterer Siwe Disease (Nonlipoid Reticulo-Endotheliosis)

Letterer-Siwe disease is a nonlipid reticulo-endotheliosis of unknown etiology occurring almost exclusively *in infants. It is almost invariably fatal*. The cause is unknown.

As far as can be ascertained from the cases available for study there is no hereditary or familial incidence. Specific *infectious* agents, endogenous metabolic disturbances, and neoplasms have been considered as possibly etiologic. No one yet has been able to find a responsible virus or bacterial micro-organism. Siwe regarded nonlipoid reticulosis as a distinct disease based on the fact that it is different in onset, course and prognosis from both Hand-Schüller-Christian disease and eosinophilic granuloma.

Generally enlargement of the lymph nodes the first sign to gain the attention of the parents. The swelling may be noticed first in the cervical region and may be followed by other enlargements on the opposite side of the neck and elsewhere. The maxillary axillary and cervical nodes as well as the inguinal may be found to be discrete and definitely palpable. Other glands may also become affected.

The rash, a generalized yellow to dark red, maculopapular eruption, may appear almost anywhere. Purpura, which has been reported, may even involve the palms and soles. The rash at times is particularly abundant on the trunk, especially the posterior aspects and the neck face and upper and lower extremities. The scalp also is frequently involved. Petechiae, purpuric spots and ecchymotic areas may be seen upon the skin interspersed between the maculopapular eruption while areas of clear skin may be found between the lesions. The ecchymotic areas and purpuric spots are due to bleeding, for bleeding is a characteristic tendency in this disease. Small bullous lesions containing a clear yellowish fluid may be found on the buttocks and thighs. The rash is generally at its height shortly before death.

A slight icteric tinge of the skin with dryness and scaliness (eczematoid eruption) has been reported. The scalp is often covered with numerous small, yellowish crusts or exudative lesions and here too purpuric spots may be seen. At other times the entire scalp presents a picture suggestive of seborrheic dermatitis. The mucous membranes of the mouth may show several reddish macules or shallow ulcerations. Usually the onset is insidious, frequently following or occurring coincidentally with an upper respiratory or other infection. As a rule fever is present throughout the entire course of the illness; it is frequently of the intermittent type. The facial expression of the sick infant suggests acute illness. As rule, there is pallor of the skin and mucous membranes, the severity depending on *the* grade of the secondary anemia present. Listlessness, irritability fatigue, poor appetite and progressive loss of weight soon follow. There is a tendency for the patient to bruise easily and to bleed. In addition there are enlargement of the liver and spleen, a hypochromic anemia, destructive lesions in the bones, especially of the skull, and miliary infiltration of the lungs the latter to be discovered by roentgenologic examination. Edema of the eyelids, face and ankles, has been reported on numerous occasions and soft tissue swellings over areas of bony involvement have been noted. Leukocytosis is a frequent finding.



Fig 133 —Hand Schüller-Christian disease in boy of 4½ years (By permission from Horsfall, F L, Jr and Smith, W R Quart J Med. 4 37 51 Jan 1935)

to yellowish papules in other instances xanthomata palpebrarum and xanthomata disseminata have been recorded. The early lesions may be mistaken for eczema. Papular vesicular or hemorrhagic rashes have been described. The skin is dry and pale the head is often scantily covered with hair and frequently shows brown-yellow crusts The scalp may show an eczematous rash which upon close inspection may disclose discrete hemorrhagic papules the size of a pinhead and pustules that are very resistant to treatment. Gingivitis and falling out of the hair are by no means rare symptoms and are sometimes the first ones noticed. They are due to a xanthomatous change in the bones of the jaw and to lesions of the scalp The mucous membranes may be affected by pigmentation Pinguecula consisting of brownish-yellow triangular conjunctival thickening, occupying the interpalpebral space on both sides of the cornea but leaving a thin white stripe around the cornea, appear slowly in the second decade. Subjective symptoms include headache pains in the legs and a feeling generally of weakness and, at times, slight fever

Diagnosis is established by finding pinguecula with splenomegaly and characteristic bone changes Illustration of the characteristic histio-





34.—Eosinophilic granuloma in an infant 6 week of age. I addition to the lesion on the hand ...ation showed about 20 papules dispersed over the trunk and extremities. Each papule was ...m. in diameter, firm and with no tendency to break down. B, photomicrograph of tissue from ...ent shows intracellular bodies, which are eosinophilic granules within the eosinophilic leuko... permission from McCrary, Holden C., and Falk, Alfred B. A.M.A. J. Dis. Child. 95 714–716. ...)

The main clinical features itemized by Siwe (1933) are the following (1) an age incidence from two months to two years, (2) an indefinite onset with no specific symptomatology (3) a febrile course lasting for a few weeks or months until death, (4) generalized enlargement of the lymph nodes, (5) enlargement of the liver and spleen (6) a hemorrhagic tendency commonly producing a petechial purpuric eruption or ecchymotic skin (7) hypochromic anemia sometimes severe, (8) destructive lesions in the bones, commonly in the skull rarely if ever in the hands and feet, but often occurring elsewhere in the skeleton e g., in the ribs, pelvis, humerus, femurs. The bone lesions may be associated with pain and tenderness, with or without overlying soft tissue swelling, or they may be clinically silent.

Letterer-Siwe disease should be differentiated from eosinophilic granuloma of bones, a benign disease which responds either to surgery or x ray Differentiation from *Hand-Schüller Christian disease* is important for prognosis. In Letterer-Siwe disease no accumulation of lipid occurs, most changes occur in the bones of the skull and fewer in the long bones petechial eruption and ecchymoses are more pronounced and more frequent and it is exclusively a disease of infants and results in early death

Secondary bacterial infection such as a purulent otitis media and angina of the throat has frequently been reported The disease is invariably fatal. The duration is from a few weeks to a few years and the course is steadily downhill

There is no method known for preventing the disease. There are no known specific remedies Penicillin, streptomycin sulfonamides and other new antibiotics are without effect. Aureomycin and cortisone given in adequate doses over a reasonable time have also been found ineffective. Prednisone should be given a trial. Supportive measures and blood transfusions are of temporary value only Fluid replacement may be indicated for dehydration. Antiphlogistic measures such as wet dressings and mild soothing ointment may be indicated.

Eosinophilic Granuloma

This form is the most benign type of reticulosis Skin lesions when present assume the character of erythematous granulomatous plaques (Fig 134 *A*) which may be followed by ulceration. Or the eruption may be polymorphous. Blood lipids are normal. Diagnosis rests upon a characteristic histologic picture (Fig. 134 *B*) of large masses of eosinophilic leukocytes seen in the granulomatous lesions. The latter are composed of solid masses of histiocytes. It is becoming more apparent that there are many variants of this disease lying between Hand-Schüller Christian disease and eosinophilic granuloma.

Any bone may be involved except those of the hands and feet The bones of the skull show lesions that resemble the acute and chronic lipophagic forms. X ray examination will reveal the bone lesions.

Pathologic fractures of bones may occur as complications. To prevent them surgical curettage has been employed for solitary lesions and roentgen therapy for both solitary and multiple lesions.

Niemann Pick's Disease

This is a familial lipoidosis of rare occurrence, especially common in Jewish infants. It is characterized by an enlarged liver and spleen and by the deposition of large amounts of lipid (diaminophosphatide-sphingomyelin) throughout the entire reticuloendothelial system. The disease is fatal with death usually occurring during the first two years.

The skin becomes dehydrated and wrinkled, owing to the disappearance of the subcutaneous fat, and attains a pale waxy appearance. The exposed parts such as the face forehead, neck and hands acquire a yellowish, brownish discoloration. Pigmented areas may be noted on the arms and blue-black spots on the tongue The mucous membranes may show pigmented patches. Profuse sweating is common. The infants present the appearance of an acute disease insidious in onset with loss of appetite and a rapid downward course which results in a thin, emaciated patient with an enormously enlarged liver and spleen The face presents a mongoloid expression. Fever simulating an infectious disease occurs

Diagnosis depends upon chemical or histologic examination of the diseased tissues. Although pigmentation and cherry red spot in the

retion are present only in Niemann-Pick s disease, a positive diagnosis cannot be based on the skin manifestations.

Nevoxantho-Endothelioma (Juvenile Xanthoma)

In this condition the lesions appear as single or multiple growths or groups of red to yellow or brown papules, dome-shaped, firm and hemispherical (Fig 135) Their size varies from pinhead to split pea or larger Occasionally the red lesions have been mistaken for angioma. As a rule, they become yellow as they grow older In any event, diascopic pressure will cause the red color to disappear and reveal the characteristic yellow Favorite sites include the extensor surfaces of the upper and lower extremities, the face and scalp, but the lesions may be irregularly scattered over the entire trunk. The lesions may appear in the first two weeks following birth or later Sometimes a history of other cases in the family may be elicited. This condition is not accompanied by an increase in the blood lipids. While the exact nature of nevoxantho-endothelioma is still controversial, it is thought to be identical with diseases of the juvenile xanthoma group. Frequently there is also evidence of the Hand-Schüller-Christian syndrome.

Systemic involvement has been reported as complication. The prognosis is usually good. The lesions tend to disappear spontaneously as the child approaches puberty although they may remain unchanged for years. There is no specific therapy although a low fat diet and thyroid are reported to be helpful.

Necrobiosis Lipoidica (Necrobiosis Lipoidica Diabeticorum)

Two forms of the disease are recognized, one in which hyperglycemia is present and one in which the blood sugar level is within normal limits. Histologically the condition is recognized by degeneration of the collagen (necrobiosis) apparently caused by toxins of diabetes mellitus The necrobiotic tissue becomes infiltrated by lipids secondarily The lipids are in all probability derived from the blood stream, where they are present in excessive amount.

The condition may occur at any age. Diabetes is found in approximately half the cases. The commonest site is on the lower extremities especially over the ankles, but lesions have been seen on the upper extremities, forearms, trunk face and even the palms and soles. Trauma is probably an important factor in the etiology

The condition begins as one or more sharply marginated, elevated, red papules which may or may not be covered by a scale. Diascopic pressure fails to change the clinical appearance of the lesion, with the papules returning to their original form on release of pressure. Then follow irregularly shaped, round or oval plaques with sharp borders and with a glazed, smooth surface appearance not unlike that of waxed paper As the lesion develops the area of the

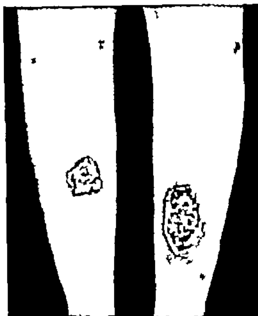


Fig 136.—Necrobiosis lipoidica in girl 14 years of age. Numerous early lesions can be seen on the legs in addition to the more advanced lesions characterized by ulceration and surrounded by violaceous border The child had diabetes with high blood sugar level. (Courtesy of Dr Meyer L. Niedelman.)

skin affected assumes the form of a yellowish plaque with evident atrophic changes and frequently covered by numerous telangiectases. Ulceration may supervene (Fig. 136) The borders of the lesions are of a violaceous, pinkish or reddish discoloration. There are no subjective

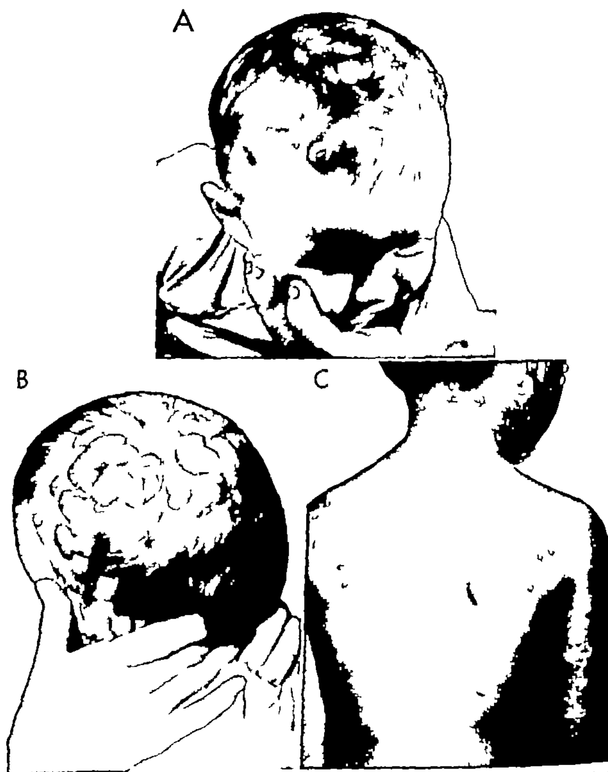


Fig. 135.—Nevoxantho-endothelioma. A, in an infant 5 months of age. The lesion on the scalp is frequently mistaken for a cavernous angioma. B in another infant in whom tumors began to appear at the age of 3 months as erythematous small nodules beneath the skin, some with a waxy appearance and about the size of a small pea to an almond. C, in a girl 4 years of age (*A* courtesy of Dr Herbert M Leavitt *B* by permission from Lamb, J H and Lain, E. S. Southern M J 30 585 1937 *C* courtesy of Dr Bernard L. Kahn.)

Hennington and his co-workers, attribute it to the lack of protein and the excess of carbohydrate over protein, as well as other factors, particularly the proportion in which various amino acids do or do not appear in the diets. These investigators believe that the lack is not in the vitamin components of the diet but in the protein elements.

The skin changes occur in two phases. In the first there is a change in the color (or depigmentation) of the skin; in the second there is dermatitis. In the first stage the Negro's color changes to a lighter shade, often light chestnut brown or reddish. The changes are best seen over the legs and ankles, especially the lateral and posterior aspects, and on the face, neck and trunk. Pronounced depigmentation sometimes seen in the area between the groins and sometimes extending to scrotum and vulva. The dermatitis of the second stage varies and may not even occur. In the fullblown case it is best seen over the back of the forearms and hands (in a symmetrical mitten distribution) back of the legs and posterior aspects of thighs and buttocks on the pressure points. There may be a "butterfly" distribution on the cheeks and over the bridge of the nose. The affected skin becomes thickened or hardened and blackish owing to hyperkeratosis and parakeratosis. Cracking or exfoliation of the plaques leaves areas of pink or paler skin and "crazy pavement" appearance. The white, pink or coffee-colored areas of paleness are seen particularly around the mouth, groins, anus, penis and armpits. Fissuring and inflammation frequently occur at the angles of the mouth and on the lips and on prepuce, vulva, perineum and scrotum. The hair also shares in the process, becoming paler, lusterless and softer. A mild generalized alopecia then follows.

The onset is sudden. The history usually elicited is that the first signs of disturbance in the child were looseness of the bowel and fretfulness. The diarrhea, which is characteristic, is persistent and refractory to treatment. The stools are putty-color, often offensive and frothy or green, resembling gastro-enteritis. Blood and mucus in the stools are seldom seen, however.

Edema, another characteristic feature, appears soon after the gastro-intestinal derangement. It is seen particularly around the eyes and also on the forearms, especially over the dorsal aspects of the wrists, on the prepuce, penis or vulva and on the lower and lateral aspects of the legs. Edema on the ankle joints causes a characteristic "foot drop." Edema may be generalized and variable from day to day. Loss of flesh is noticeable, especially over the chest, face, thighs, buttocks, legs and forearms. The tongue becomes red and glazed as the disease progresses.

The infant's position is characteristic. He lies curled up, burying his head on his mother's bosom and avoiding the light. His legs are drawn up and his back is curved in a jackknife position. Steatorrhea is an inconsistent sign. The liver may be slightly enlarged and tender on pressure.

TABLE 20.—Differential Diagnosis Between Kwashiorkor and Pellagra

	Kwashiorkor	Pellagra
Age	Common in young children	Extremely uncommon in young children
Dermatitis	When prominent, disease is well entrenched	Severe dermatitis may appear before constitutional signs are apparent
Rash	Has no relation to the exposed areas	Skin is photosensitive; rash appears only on exposed areas and disappears when they are protected
Early stages of rash	Skin is dark, soft and crumpled, strips easily and raw surface is left	Dry branny desquamation
Milk diet	May account for some cases of kwashiorkor	No relationship to milk
Mortality	High in untreated cases	Not common cause of death

From Williams, C. D. J.A.M.A. 153:1280, 1953

The disease in its typical form is not difficult to diagnose from the chief signs (diarrhea, edema and skin and hair changes) already described. Points that differentiate it from pellagra are summarized in Table 20.

Without treatment, profound mental changes may occur in the terminal stages. However

symptoms. There is no specific therapy In cases characterized by hyperglycemia a diet poor in fat and relatively high in carbohydrate with injections of insulin may be given a trial.

Lipodystrophy

Lipodystrophy is characterized by a loss of subcutaneous fat of the face, neck, thorax, arms and abdomen, without assignable cause or gross symptoms of ill health The etiology is obscure The condition occurs with greater frequency (3 1) in females than in males. It begins in early life, usually between 4 and 6 years, although several cases have been reported in infants A familial occurrence and several hereditary cases have been reported. Previous diseases, including measles, influenza, pneumonia, pertussis, tonsillitis, have been incriminated as precipitating factors but without real proof It has been suggested that the pathogenesis may be an atrophic change in the nervous system an endocrine disturbance or a disease of the fat tissue

The essential feature of the disease is a loss of the subcutaneous fat in the upper part of the body with a pronounced increase of fat deposits in the region below the crest of the ilium. The onset is insidious the condition occurs slowly and is often unrecognized until it is far advanced. An observant mother may notice that her child's face is becoming thinner With time the subcutaneous fat pads disappear Slowly but surely usually after years, the upper extremities neck and trunk also become affected. This gradual loss of fat is symmetric and slowly progressive to the stage of an almost complete disappearance of fat in the affected areas

The condition is characteristic in its full-blown state so that upon the appearance of the face alone a diagnosis can be made almost conclusively As Bilderback puts it, "the patient has a cadaver-like expression and when the child cries the muscles stand out prominently as in a dissection. The emaciation of the face, thorax and upper extremities at first glance makes one think of a grave constitutional disease such as tuberculosis. However closer examination shows that the fat loss has affected only the upper part of the body while the lower part seems at least normal or by contrast proportionately larger To quote Parkes-Weber "The lower half of the body looks like a model of one of Rubens pictures and *the upper half like* one of the witches in Shakespeare's *Macbeth.* In some cases when the face alone is affected, the facial expression is haggard and aged. However in most cases the face, neck, arms and upper thorax partake in the fat loss

The buttocks and legs are larger than normal apparently owing to an increased deposit of fat. Only the subcutaneous fat is affected, biopsy studies show the skin, muscles and bone to be normal.

There are no constitutional symptoms and there is no disturbance of sensation or sign of ill health.

Diagnosis is comparatively easy once the condition is fully developed. The old-looking face with the shallow hollow cheeks due to the disappearance of the buccal fat pads, and the sunken eyes, together with atrophy of the fat of the neck, arms and upper part of the trunk and increased fat deposits in the buttocks and thighs renders the clinical picture unmistakable The disease has an insidious onset. In differential diagnosis there may need to be considered the wasting due to organic disease such as tuberculosis and cancer pituitary cachexia, dermatomyositis progressive facial hemiatrophy trophedema of Meige, adiposis dolorosa, acroscapulohumeral muscular dystrophy progeria and lipodystrophy due to insulin injections.

There are no complications. Lipodystrophy is not a fatal disease the prognosis as to life is good. Once the fat has disappeared, however it never returns. There are no specific remedies.

Protein-Carbohydrate Metabolism

Kwashiorkor

The name "kwashiorkor" literally means red boy and the condition was so named when it was first reported, among African Negroes, to describe the color change that is the most distinctive manifestation. The disease has also been called the "pellagroid beriberi syndrome and infantile pellagra For some years it was believed to be a nutritional disturbance in which the chief deficiency was the vitamin B complex Some clinicians are still of this belief although recent investigations, among them the work of

of the legs, usually the anterolateral aspects. The thick, irregular indurated areas on the legs are symmetrically situated and are either erythematous, pinkish or yellowish white. They may even be the color of normal skin with a dimpling of the hair follicles producing the pig skin effect. This condition has been mistaken for scleroderma. The skin of the scrotum may be thickened and the scrotum enlarged.

The prognosis in juvenile myxedema is better than in cretinism and depends on instituting thyroid therapy as soon as a diagnosis has been reached. The dosage of thyroid extract or Proloid is similar to that for cretinism. ACTH and cortisone have been of definite value in localized myxedema.

Cretinism

The clinical features of sporadic cretinism are well known to pediatricians and are well described in the standard pediatric textbooks. The condition is discussed here, therefore, only from dermatologic point of view.

The signs and symptoms are seen at or shortly after birth. The skin of a cretin is dry, thick, wrinkled and cool. Perspiration is diminished or absent. I many cretins the skin is loose and, as Butterworth has described it, seems too large for the underlying structures. The skin may be of a pasty white color or appear bronzed. Pallor is common. The hair is sparse, coarse, dry and brittle. In some instances there is alopecia of the scalp. The eyebrows may show a sparseness of the outer one third and the eyelashes may be absent or few in number. Myxedematous deposit in the skin of the eyelids may cause the eyelids to become approximated, thereby exaggerating the dull, lethargic facial appearance. The lips are thick, the tongue appears thickened and large and often protrudes from the mouth. Interesting are the thick pads of myxedematous tissue in the supraclavicular fossae. The hands are thick and spatulate. The nails are more fragile, brittle and thinner than normal. Swelling of the mucous membranes, especially of the mouth, nose and throat, interferes with respiration and causes snoring, mouth breathing is common. Dentition is delayed. Cretins are unusually sensitive to cold.

Butterworth has shown that the minimum erythema dose of ultraviolet light is greatly increased and that much less pigmentation develops in cretins following ultraviolet light irradiation than in normal controls. He notes also the absence of a normal response to stroking and he postulates that these phenomena are perhaps due to a lessened liberation of histamine following trauma, since the mast cells are decreased in the skins of cretins.

The prognosis is good provided treatment is instituted early with thyroid, administered persistently and continuously in adequate dosage. A useful thyroglobulin preparation for this purpose is Proloid, which may be given in a daily dosage of 0.03 Gm. during the first week, 0.06 Gm. during the second week, 0.1 Gm. during the third week, followed by a maintenance dose of 0.13 Gm. daily. Thyroid U.S.P. may be used instead of Proloid, in the following dosage: up to 1 year of age, ¼ gr. (0.015 Gm.); 1 to 3 years of age, ½ gr. (0.032 Gm.); 3 to 5 years of age, ⅗ gr. (0.040 Gm.) to 1 gr. (0.065 Gm.) given daily. Under such a therapeutic regimen the color of the skin returns to normal and perspiration is increased. If evidence of overdosage occurs, manifested by tachycardia, irritability, loss of weight, diarrhea and sweating, the dosage should be reduced.

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Prophylaxis calls for the use of a well balanced diet particularly rich in milk The 50 Gm. of protein needed in even a mild case can be provided with 150 Gm. of dried skimmed milk which contains about 34 per cent protein. Small meals given frequently with a large proportion of milk and in the beginning very little fat, are advisable as suggested by Pennington and his co-workers. In severe cases protein may be administered in the form of repeated transfusions of packed red blood cells Any associated diseases should receive appropriate treatment.

Amyloidosis

Three forms of amyloidosis are recognized (1) primary systemic amyloidosis, (2) primary localized amyloidosis of the skin also known as *lichenoid amyloidosis* and (3) secondary systemic amyloidosis. In primary localized amyloidosis the skin alone is affected and deposits of amyloid occur in the skin without involving other organs. In the secondary systemic form the skin may or may not share in the disturbed metabolic disorder

In primary localized amyloidosis of the skin the lesions containing amyloid are usually found on the legs. They appear in the form of many discrete closely grouped papules or nodules and are of a brownish to brownish red color at times translucent The surface of the plaque is roughened and scaly Petechiae and purpura may also be seen Pruritus may become an annoying symptom. In the primary systemic type the tongue may show evidence of inflammation and may be greatly enlarged. Chronic suppurative diseases and diseases accompanied by wasting (e.g tuberculosis and chronic osteomyelitis) may be of etiologic importance in secondary systemic amyloidosis. In the latter amyloid deposit also occurs in other organs such as the liver spleen, kidneys and adrenals. However skin lesions are uncommon.

The Congo red test may be of considerable help in diagnosis. This test consists in introducing a small quantity of the dye into the affected areas of the skin If amyloid is present the injected site becomes discolored red with the discoloration lasting for approximately a week and a half If the skin eruption is not due to amyloid, then the red dye is absorbed and disappears after several days.

There is no specific therapy Management should be directed to the underlying chronic disorder when one is present.

Myxedema

Infantile and juvenile myxedema are uncommon. As is true in adults the condition is usually associated with hypothyroidism. Myxedema in childhood has been known to follow infections apparently the febrile reaction associated with infection produces a thyroiditis. Trauma is also said to be a factor in the etiology Surgical intervention on the thyroid gland is seldom followed by myxedema in children. While the clinical symptoms and signs of cretinism are seen at birth or shortly after myxedema is acquired at a later period in life When myxedema occurs during infancy the clinical signs closely simulate those of cretinism and differential diagnosis may be difficult. On the other hand, myxedema during childhood more closely resembles that of adult life.

The clinical features of the *generalized form* consist of thickenings and swellings of the skin due to mucin. The face and extremities are the favorite sites for such swellings. The deposit of mucin in the skin of the lower lids may impart to the face an expression not unlike that seen in nephritis and nephrosis, for which conditions myxedema has at times been mistaken. The skin is dry shiny waxy and even scaly but it does not pit on pressure. Firm nodular thickenings may be seen. The face is expressionless and presents a characteristic pallor and puffiness. The lips are thick The skin of the legs may have the texture and appearance of pigskin Perspiration is lessened or absent. The hair of the scalp and eyebrows may show evidence of alopecia. Usually the hair loss is confined to the outer third of the eyebrows. The eyelashes may be few in number or lacking Myxedematous children, like cretins, are unusually sensitive to cold, they feel more comfortable in warm clothes and prefer to remain indoors during cold weather

Localized solid edema also known as circumscribed myxedema is confined to the lower half

of the legs, usually the anterolateral aspects. The thick, irregular indurated areas on the legs are symmetrically situated and are either erythematous, pinkish or yellowish white. They may even be the color of normal skin with a dimpling of the hair follicles producing the pig skin effect. This condition has been mistaken for scleroderma. The skin of the scrotum may be thickened and the scrotum enlarged.

The prognosis in juvenile myxedema is better than in cretinism and depends on instituting thyroid therapy as soon as a diagnosis has been reached. The dosage of thyroid extract or Proloid is similar to that for cretinism. ACTH and cortisone have been of definite value in localized myxedema.

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The clinical features of sporadic cretinism are well known to pediatricians and are well described in the standard pediatric textbooks. The condition is discussed here therefore, only from a dermatologic point of view

The signs and symptoms are seen t or shortly after birth. The skin of a cretin is dry thick, wrinkled and cool. Perspiration is diminished or absent. In many cretins the skin is loose and, as Butterworth has described it, seems too large for the underlying structures. The skin may be of a pasty white color or ppear bronzed. Pallor is common. The hair is sparse, coarse, dry and brittle. In some instances there is alopecia of the scalp. The eyebrows may show a sparseness of the outer one third and the eyelashes may be absent or few in number Myxedematous deposit in the skin of the eyelids may cause the eyelids to become approximated, thereby exaggerating the dull, lethargic facial appearance. The lips are thick; the tongue appears thickened nd large and often protrudes from the mouth. Interesting are the thick pads of myxedematous tissue in the supraclavicular fossae. The hands are thick and spatulate. The nails are more fragile, brittle, and thinner than normal. Swelling of the mucous membranes, especially of the mouth, nose and throat, interferes with respiration and causes snoring; mouth breathing is common. Dentition is delayed. Cretins ar unusually sensitive to cold.

Butterworth has shown that the minimum erythema dose of ultraviolet light is greatly increased and that much less pigmentation develops in cretins following ultraviolet light irradiation than in normal controls. He notes also the absence of a normal response to stroking and he postulates that these phenomena are perhaps due to a lessened liberation of histamine following trauma, since the mast cells are decreased in the skins of cretins.

The prognosis is good provided treatment is instituted early with thyroid, administered persistently and continuously I adequate dosage. A useful thyroglobulin preparation for this purpose is Proloid, which may be given in a daily dosage of 0 03 Gm. during the first week, 0.06 Gm. during the second week 0.1 Gm. during the third week, followed by a maintenance dose of 0 13 Gm. daily Thyroid U.S.P may be used instead of Proloid, in the following dosage up to 1 year of age ¼ gr (0.015 Gm.) 1 to 3 years of age, ½ gr (0.032 Gm.) 3 to 5 years of age, ⅔ gr (0.040 Gm.) to 1 gr (0.065 Gm) given daily Under such a therapeutic regimen the color of the skin returns to normal and perspiration is increased. If evidence of overdosage occurs, manifested by tachycardia, irritability loss of weight, diarrhea and sweating, the dosage should be reduced.

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23

Changes in Pigmentation

CHANGES IN pigmentation of the skin may occur with changes in the amount of melanin produced by the melanocytes. Hyperpigmentation occurs when the melanocytes are stimulated to overproduction or when they are increased in number. Depigmentation occurs from a lessened production of melanin. In addition, changes in skin coloration occur from ingestion of excessive amounts of carotene and of certain drugs, and also in certain diseases.

Discussed in this chapter are acanthosis nigricans, congenital cutaneous dystrophy, albinismus, vitiligo and carotenemia.

Acanthosis Nigricans

Acanthosis nigricans is a disease characterized by hyperpigmentation, papillary hypertrophy, papillomatosis and verrucous lesions. There are two types: (1) the juvenile or benign type, of long duration but not terminating fatally and (2) the adult or malignant type, which is of short duration and ends fatally because of malignant tumor of the intestinal or other organs with which it is believed to coexist.

A sharp line of distinction between the benign juvenile and the adult malignant type cannot be drawn from age alone inasmuch as a few cases of malignant acanthosis nigricans have been reported in infancy and childhood. Furthermore, as Curth has pointed out, the terms "malignant" and "benign" are far more satisfactory than the terms "adult" and "juvenile," since children may suffer from and die of malignant acanthosis nigricans while otherwise healthy older persons may suffer from benign acanthosis nigricans for many years.

Etiology.—The exact cause is unknown. Some investigators believe that one of the determining factors may be a congenital developmental anomaly that does not manifest itself until early or adult life. In the benign type, toxins, metabolic and endocrine disturbances have been thought to be causative as well as other factors having a direct or indirect effect on the chromaffin and sympathetic system. A genetic relationship between acanthosis nigricans and cancer has been suggested. Benign acanthosis nigricans may begin at birth, during childhood or at puberty. It reaches its height with adolescence and then either regresses or remains stationary. From reports in the literature of cases of the pituitary type of obesity associated with juvenile acanthosis nigricans, there is evidence suggesting that pituitary disturbance plays a role in the cutaneous picture. Speaking for an endocrine etiology are the many instances in which the benign type is found in association with genital hypoplasia, cryptorchism, acromegaly, achondroplasia, dwarfism and diabetes.

Clinical Picture.—The essential feature of the condition is a striking hyperpigmentation of the skin of the axillae, neck, external genitalia and other flexural surfaces. The discoloration varies from dark brown to gray and even black. Hyperpigmentation may also be present on the soles, the toes, around the umbilicus, on the flank and in the perianal area. At times the

areas of greatest pigmentation may appear thickened and velvety An increase in the folds of the skin with hyperkeratosis and exaggeration of the normal cutaneous markings (Fig 137 *A*) and papillomatous and verrucous lesions may be seen The most pronounced changes take place in the flexures which are *the sites of predilection* The hyperpigmentation (Fig 137 *B*) which is striking may occur soon after birth. Hyperkeratotic changes may be seen in the palms and soles. The tongue and mucous membranes of the mouth, pharynx, larynx and vagina may present warty excrescences.

The two forms can be differentiated by the characteristics tabulated in 1909 by Bogrow (Arch. Dermat. u Syph 94 271 1909)

Malignant Form	Benign Form
1 Coexistence of serious disease of the internal organs (chiefly carcinoma)	1 General health undisturbed or only minor disturbances.
2. Unfavorable outcome as to life	2 Fatal outcome never reported
3 Disease of short duration.	3 Unlimited duration.
4 Intensity and widespread distribution of lesions.	4 Lesions not very prominent and not widespread.
5 Disease shows alterations exacerbations and remissions. Sometimes complete disappearance of external manifestations.	5 The disease remains almost stationary
6 Disease develops late in life.	6. The disease develops in youthful patients.

Diagnosis.—The cardinal features are the histopathologic picture of papillary hypertrophy the pigmentation most pronounced in the flexures the papillomatosis and verrucous lesions The appearance of the lesion may simulate that of Addison s disease hemochromatosis arsenical pigmentation pellagra ochronosis and argyria. The surest way to differentiate these diseases is by microscopic study Histologically the condition is unmistakable the marked hyperkeratosis, papillomatosis acanthosis and hyperpigmentation form an easily recognized pattern

Complications and Prognosis.—Curth states that many inherited anomalies of various types have been noted among patients with benign acanthosis nigricans. Among the disturbances mentioned are von Recklinghausen s disease (*neurofibromatosis*) and mental retardation (one case) a degenerative disorder of the spinal cord involving the pyramidal tracts, epilepsy and mental retardation (one case) various kinds of inherited disorders, conditions occurring in several members of the same family—chondrodystrophy dwarfism and mental retardation in association with diabetes mellitus. One case showed congenital anomalies (a rudimentary kidney ureter and a supernumerary nipple)

In the juvenile type the prognosis is good. In the adult type it is grave.

Treatment—The benign type requires no therapy When a diagnosis of the malignant type has been made, further studies are indicated to determine the presence of malignant growth, which calls for surgical intervention.

Congenital Cutaneous Dystrophy

(Poikiloderma Congenitale, Thomson s Syndrome)

This condition was first described and named by Thomson in 1923 It is a disease characterized by tense red edematous patches, usually appearing at birth or in infancy and followed later by reticulated telangiectatic areas which become pigmented scaly and crusted, especially over the bony prominences

The exact cause is unknown Females are more frequently affected than males. Cole and his co-workers believe it to be a variant of the congenital ectodermal dysplasia group of skin diseases. Exposure to the sun seems to play some part in bringing out the rash It has occurred in siblings but there is thus far no evidence of an etiologic basis in heredity Consanguinity apparently has not been observed to date and there has been no evidence of syphilis in the family histories. It has been reported in an infant with microcephaly

Clinical Picture.—The lesions at first are usually symmetrically situated over the bony prominences such as cheeks, hands feet and buttocks. Later other areas such as the face and extremities may become involved Early the lesions consist of small red patches or pinhead vesicles with some patchy erythema The lesion





Fig. 137.—Acanthosis nigricans, juvenile type. A shows involvement of lateral surface of neck. Note the increase in the furrows of the skin. B showing involvement of anterior chest, the tinea versicolor lesions are superimposed on the pigmented patches of acanthosis nigricans. (By permission from Robinson, S. S. and Tasker, S. Arch. Dermat. & Syph., June 1947.)

is characteristic when examined carefully There is a bright red mottled pattern of telangiectasis, slightly or highly shiny and with occasional patches that may be scaly or horny It is accompanied by swelling. The swelling later subsides and the reticulated telangiectatic area becomes pigmented and scaly or covered with crusts. The telangiectatic network may also show on the eyebrows and on the outer edges of the ears. Indeed the entire length of the arms, forearms and hands as far as the finger tips may become involved Lesions may also appear on the gluteal areas and on the posterior aspects of the thighs and legs. In Thomson's first case the entire areas of the knees were "wrapped" round by the rash as by a bandage. He pointed out that the knees were the only areas of the entire body where the internal aspects of the limbs showed changes. Still later atrophic changes in the skin are seen to be associated with pigmentation, but the pigmentation is of a brown color irregular and smudge-like. The hands may appear cyanosed and cold The mucous membranes are unaffected. There are no constitutional symptoms.

Diagnosis.—The following features are diagnostic characteristics. The patients are usually female. The eruption always begins in infancy on the prominences of the buttocks and cheeks as a pink swelling which is later transformed into a telangiectatic network interspersed throughout with a few larger and whiter patches Then at a later period similar changes appear gradually on the lateral and posterior aspects of the upper and lower extremities also on the eyebrows and over the external folds of the ears. Finally pigmentation gradually replaces the vascular network. All affected areas show a fine atrophy of the skin.

Differential Diagnosis.—In differential diagnosis there must be considered the diffuse idiopathic atrophies, including Schamberg's disease Majocchi's disease angioma serpiginosum the livedos, anetoderma of Jadassohn, acroasphyxia, xeroderma pigmentosum, parakeratosis variegata telangiectasia hemorrhagica hereditaria syphilitic telangiectasia, poikilodermatomyositis and Jacobi's poikiloderma atrophicans vasculare.

Congenital cutaneous dystrophy most closely resembles *poikiloderma atrophicans vasculare* (Jacobi) In both conditions one finds telangiectasia, pigmentation and atrophic changes in the skin However the Jacobi type of poikiloderma first appears during adult life, occurs in either sex is more widespread on the skin and also involves the mucous membranes, all of which *points are in contrast to congenital cutaneous* dystrophy The other disease entities enumerated are differentiated by their clinical features and by means of laboratory tests and histopathologic studies.

Complications and Prognosis.—Complications reported include developmental changes in the bone and sudden and complete loss of the hair of scalp eyebrows and lashes. The condition is very chronic with the lesions on the face persisting longest.

Treatment—There are no known drugs of therapeutic merit for treatment. When Thomson used small doses of thyroid gland empirically after a while the patient's general condition improved, the cyanosis vanished and the tense swelling of the face and buttocks disappeared. Animal fats (e.g goose grease, lard, lanolin) should be tried for a dry and scaly skin. The hands and feet when cold and cyanotic should be protected with woolen garments.

Albinismus

Albinism as the name indicates, is characterized by a congenital absence of pigment, partial or complete, involving the skin, hair and eyes. Both partial and complete types occur in all races and are believed to be inherited as recessive characteristics, apparently sex-linked.

In the partial type, the lesions consist of variously sized oval, rounded or irregular areas of depigmented skin on the trunk, upper and lower extremities or elsewhere. (Some authors, however use the term "partial albinism to describe a type that although universal is qualitatively incomplete.) There may even be only one depigmented patch When depigmentation involves the mid-frontal portion of the scalp a white forelock results. In occasional instances the depigmented area may follow the course of a cutaneous nerve.

In the complete type the condition is accompanied also by a complete absence of pigment (melanin) in the hair The skin of true albinos is milky white or light pink their hair is

milklike, white or pale yellow or in some instances even red; the iris is transparent or of a pink or bluish hue.

The partial type can be differentiated from *leukoderma* by the fact that the former is congenital and hereditary and the patches are well defined whereas the latter appears after birth and the depigmentation follows a dermatosis, e.g. atopic dermatitis or seborrheic dermatitis.

Both true albinos and persons with partial albinism sunburn easily and fail to tan. True albinos often complain of photophobia, nystagmus and astigmatism. Imperfect mental development and physical defects, including tuberculosis, have been reported in some subjects. The condition is lifelong and there is no specific remedy. Direct exposure to the sun should be avoided. Sun screens consisting of creams, lotions and ointments should be utilized.

Vitiligo

(Acquired Leukoderma)

Vitiligo is an acquired pigmentary alteration in the skin characterized clinically by depigmented patches of various shapes and sizes frequently with a hyperpigmented border. The cause is unknown.

Some of the depigmented areas may coalesce in larger patches. The regions particularly affected include the skin of the face, (Fig. 138) neck, back of the hands, *external genitalia* trunk and extremities. The hair in those affected areas may or may not share in the depigmentation. Spots may be few or widespread. Obviously vitiligo is more conspicuous in dark-skinned persons and in Negroes. Subjective symptoms are absent and the health of the patient remains unimpaired.

Under ultraviolet light the depigmented spots show up beautifully. Under the Wood light in even the mildest case the depigmented areas are a vivid white in contrast to the deep brown-black hue of the normal areas or the hyperpigmented borders.

The lack of scaling and the distribution and in differentiation from *tinea versicolor* the skin is not ivory-colored, shiny and hidebound to the subcutaneous tissues as it is in *morphea*, the spots enlarge and may be surrounded by hyperpigmented borders in contrast to *familial whiteskin spotting* and the patches are not accompanied by sensory changes as they are in *anesthetic leprosy*.

The only complication likely to arise is a severe sunburn of the depigmented areas after exposure to strong sunlight. Vitiligo may progress for a number of years and then become stationary. In rare instances the pigment may



Fig. 138.—Vitiligo an infant 2 years of age. Depigmented areas also appeared on the chest, neck and flexor surfaces of the left upper extremity. (Courtesy of Dr. Irwin I. Lubowe, New York Medical College, Metropolitan Hospital Center New York.)

be restored. It should be remembered that in young children the "disfigurement" may cause psychic difficulties.

There is no known specific treatment. Methods used to camouflage the depigmented areas include local application of 10 per cent alcoholic solution of oil of bergamot, application of Kromayer quartz light, freezing with carbon dioxide snow, disguising with Covermark and staining with 0.5 per cent solution of potassium permanganate or walnut juice.

Recently considerable interest has been aroused in the use of an Egyptian drug, psoralen, crystalline constituents of the plant *Ammi majus*, Linn., given orally together with ultraviolet light exposures. Three preparations are available: Bimoldin and Oxsoralen, which con-

tain 8-methoxypsoralen and Meladinine which contains 8-methoxypsoralen and 8 isoamylene oxypsoralen.

Blomoidin (tablets containing Ammoidin 10 mg. and Ammidin 5 mg.) is administered in daily dosage of 1 2 tablets for a child weighing 60 lbs 2 2½ tablets for a child of 80 lbs. 3 tablets for a child of 100 lbs. and 3 3½ tablets for a child of 110 lbs. The dosage is continued throughout the course of treatment (of which an essential part is irradiation with sunlight or ultraviolet rays) unless intolerance occurs, when it should be reduced or treatment withheld every fourth week.

Oxsoralen (in capsules containing 8 methoxy psoralen 10 mg.) is administered in daily dosage of 1 capsule per day for a child 1-6 years of age. Children over 6 years of age usually tolerate the adult dose of 2 capsules at one time per day followed by a drink of milk. The Oxsoralen lotion for local treatment may be painted on small, well defined vitiliginous areas. Hepatic insufficiency contraindicates its use.

Irradiation of the leukodermic areas with sunlight or ultraviolet rays is an essential part of the treatment with these preparations and it should always follow the topical application of Blomoidin solution It is best applied nightly before bedtime. Exposures to sunlight are best carried out between 10 A M and 4 P M., starting with 5 minutes and gradually increasing the exposure period according to the patient's tolerance. If ultraviolet light irradiation is used exposure should begin with ½ minute at a distance of 30 in Exposure time can be gradually increased by ½ minute at a time until 5 minutes are reached Distance remains at 30 in for the first 10 consecutive days and is then dropped 2 in. each day until 18 in. is reached. Maximum time for exposure to sunlight or to ultraviolet irradiation is 15 minutes. In case of blistering, an ice pack should be applied to the affected areas. Topical applications with the solution are reported to be helpful but not absolutely necessary in order to initiate repigmentation. When they are used they are best started from 7 to 15 days after use of the tablets in order to prevent or minimize severe local reactions and their use is best restricted to one or two vitiliginous lesions.

Meladinine also can be used orally and locally and, while oral treatment alone is reported to be more effective than local treatment, oral and local treatment combined is said to produce better results. Meladinine solution contains 7.5 mg. 8-methoxypsoralen and 2.5 mg. 8-isoamylene-oxypsoralen per cubic centimeter of alcoholic solution. Meladinine tablets contain 10 mg. 8-methoxypsoralen plus 5 mg. 8-isoamylene-oxypsoralen

Leukoderma Acquisitum Centrifugum ("Halo Nevus")

This condition represents a form of vitiligo. The lesions consist of small oval or rounded, snowy patches, in the center of each of which appears a small rounded brown pigmented maculopapule or mole (Fig 139) The border of the lesion is normally pigmented It is not uncommon. Several cases have been reported in children No treatment is required.

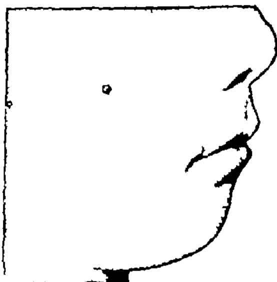


Fig. 139 —Leukoderma acquisitum centrifugum of three month's duration in a boy 7 years of age Note that a vitiliginous (depigmented) area surrounds the mole located in the center of the lesion. This boy also has several nevus anemicus lesions on his trunk

Carotenemia

(Carotenoid Pigmentation of the Skin)

Carotenemia is a condition characterized by a yellowish pigmentation of the skin resulting

from ingestion of large quantities of vegetables and fruits rich in carotene. It is seen mostly in infants and children but it may also occur in adults with diabetes and myxedema and it is common among vegetarians. Infants who receive large quantities of foods rich in carotene, such as carrots, are especially prone to the condition. Although it is not infrequently seen in pediatric practice, it is generally overlooked. The infant or younger child often receives a raw carrot or two daily

Carotene is a yellowish lipochrome—a pigment which occurs in plants and is one of the precursors of vitamin A. Under normal conditions the blood serum contains a small amount of carotene and also the closely related pigment xanthophyll, but these together do not exceed 0.1 mg. per 100 cc. of serum. When the liver does not convert carotene into vitamin A (owing, for example, to the ingestion of excessive amounts of carotene-rich foods) carotenemia *may occur. On the other hand, because the ab*sorption of carotene is almost completely inhibited by the absence of bile, carotene cannot be absorbed in the absence of fat. Obstructive conditions of the bile ducts, congenital absence of the bile ducts, and steatorrhea also may account for a reduced absorption of carotene and its proper conversion into vitamin A in the liver Excessive and continued use of mineral oil as a laxative, by tending to coat the intestinal mucosa, likewise may interfere with the absorption of carotene.

Foods high in carotene (known as xanthophyll fruits and vegetables) include carrots, squash, oranges, pumpkin, yellow and white turnips, parsnips, spinach, green and yellow beans, lettuce, peaches, apricots, bananas, cucumbers and tomatoes. Rutabaga (Swedish turnip) laver (an algae) and cilo contain carotene. Egg yolk, chicken fat, milk, butter and fat also contain carotene or vitamin A.

The yellowish discoloration of the skin is found in areas where there is an abundance of the stratum lucidum and stratum granulosum. Accordingly palms, soles, face, particularly the nasolabial folds around the nostrils, forehead, chin and posterior auricular folds best show the pigmentation.

Carotenemia is differentiated from jaundice by an examination of the scleras, which are not discolored. In contrast to jaundice the stools are of a normal color the urine does not contain excessive amounts of bile pigment and the bile pigments of the blood serum stay within normal limits although the carotene pigment is increased.

Prognosis invariably is good. The discoloration disappears in several months provided foods rich in vitamin A are eliminated from the diet. Vegetables other than those high in vitamin A content may be substituted or a few carrots may be given weekly instead of several daily

Mineral oil (liquid petrolatum) in doses of 20 cc. *daily will serve to reduce the absorption* of vitamin A or carotene. The disappearance of the yellowish discoloration of the skin follows in from four to eight weeks.

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24

Diseases Due To Physical Agents

INCLUDED in this chapter are diseases due to cold heat, ultraviolet rays, roentgen and radium rays and heavy metals. They include chilblains frostbite burns sunburn radiodermatitis acrodynia and beryllium granuloma

Chilblains

(Erythema Pernio)

A chilblain is a local condition usually limited to the hands and feet and caused by exposure of the parts to extreme cold. Subjects of chilblains usually have cold hands and feet and are generally in a poor state of health or malnourished During the cold season soon after exposure the patient complains of a tingling or burning sensation in the toes and fingers usually associated with a mild pruritus Examination of the affected parts will show that they are erythematous or perhaps present bluish red plaques or patches. Usually they are swollen. Children affected with chilblains almost invariably exhibit cool and *clammy hands and feet The parts most frequently* affected are the fingers and toes, but the heels, ears and face may also be involved The condition improves with the onset of warm weather but recurs in the cold season. Subacute lupus erythematosus and sarcoidosis should be differentiated. A chilblain can be differentiated from the former by the lack of atrophic changes telangiectasia and leukopenia and of other signs characteristic of *lupus erythematosus* It can be differentiated from *sarcoidosis* by the lack of changes in other parts of the body that are revealed in the latter by x ray examination and by biopsy

Usually there are no complications. The prognosis is good The condition may last for hours or days It is followed by desquamation of the skin *Prevention* consists in protecting the affected area by the use of extra clothing on hands and feet and avoiding extreme degrees of cold. Every child subject should receive a complete physical examination in order to discover and correct any underlying disturbances.

Treatment consists in rubbing the affected parts at night with a bland oil such as olive oil or cocoa butter in the hope of improving the circulation. Inorganic iron is indicated when secondary anemia is present. The diet should be well balanced and include vitamins, especially vitamin A and sufficient rest and exercise should be encouraged. Nicotinamide may be administered in doses of ½ to 1 ampule (50-100 mg.) *intramuscularly daily or nicotinamide* tablets, each containing 50 mg. may be given to the older child (3 to 5 tablets daily)

See Formulary ℞ 103 107 hematinics.

Frostbite

(Dermatitis Congelationis)

Frostbite is an injury to the skin and subcutaneous tissue or even bone resulting from

freezing, which deprives these areas of their vascular supply

Frostbite is the counterpart of burns with the difference that the resulting lesions are induced by an intensity of cold. Wind velocity and wet mittens or socks are additional contributory factors; atmosphere humidity has no part in causation.

Not unlike chilblains, the parts affected are usually the fingers, toes, ears, nose and cheeks. In milder degrees, erythema and edema occur soon after the injury and these signs may be accompanied by a burning, smarting and itchy sensation, especially as the affected parts become warmed. More severe types of frostbite are not unlike the lesions seen after a second degree burn. Vesicles and bullae and even ulceration may be seen In the most severe types of frostbite, gangrene may follow with necrosis of the skin and subcutaneous tissue and even of the bone. Loss of the affected parts has been reported. Constitutional symptoms usually occur in the more severe types *Diagnosis* is made by the history of exposure to extreme cold and by the clinical signs and symptoms described.

The *prognosis* is generally good provided the circulation is restored gradually Diabetic children especially should be protected against the possibility of frostbite. They should not be permitted to remain outdoors for long periods during severe freezing weather nor should they shovel snow Susceptible children should be protected by adequate clothing and should wear ear protectors, mittens and gloves, and well-fitting shoes with wool socks.

In *treatment* an effort should be made to avoid too rapid return of circulation. The use of snow is now regarded as obsolete. Probably the best treatment for the milder forms of frostbite as in affected areas of the face, is the use of warm hands by the person treating the patient, or the covering the affected parts with clothing after warmth is restored Gentle massage should follow Vesicles and bullae should be opened under aseptic precautions. Hot drinks, such as hot tea, will aid considerably in warming the body Following the acute stage, baking, infrared light and light massage may be useful. Gangrene calls for surgical intervention.

See Formulary ℞ 5 a wet dressing for mild forms (erythema and edema) 39 69 as antiphlogistics for subacute stage.

Burns

Clinically depending upon their cause and severity burns are characterized by erythema, edema, vesicles bullae and gangrene and, in severe cases, are accompanied by constitutional disturbances. A simple classificat on recognizes three degrees of severity First degree burns, involve only the epidermis and should heal without scarring. Second degree burns, because of a partial destruction of the dermis, result in a variable amount of disfigurement owing to superficial scars. The amount will depend on the thickness of the skin and the area affected as well as upon complications, such as those resulting from bacterial invasion. First and second degree burns are referred to as "partial thickness burns. They are characterized by a partial skin loss. Third degree burns are referred to as "full thickness burns They are characterized by a total skin loss. Because, also, varying amounts of the underlying tissues have been destroyed, they will heal only by scar formation.

Five etiologic types of burns are recognized, thermal light ray electrical, roentgen ray and radium and chemical. In infants and children, burns from hot water and from clothes catching fire are the most common. Hot water burns are usually first and second degree those from clothes catching fire third degree. Statistics show that severe burns are the cause of 2.8 per cent of accident fatalities among children from 1 to 4 years of age and rank second only to transportation fatalities. Among one year olds, burns and conflagrations rank first.

Clinical Picture.—Because of the delicate dermal network and the poorly developed stratum corneum, infants react violently even to minor burns. The type of burn will, of course, depend upon whether the cause is a liquid or solid and upon the intensity and duration of the contactant with the person.

First degree burns are characterized by erythema and some edema. The redness as a rule disappears in the course of a few days.

In second degree burns, in addition to erythema and swelling of the parts, vesicles, bullae or both appear The contents of the vesicles are

clear at first, then become turbid. This stage is followed by rupture, with the exudate drying and leaving crusts. On the other hand, the vesicles may rupture to leave raw denuded areas. *Burns of this degree usually clear up in one or two weeks*

In *third degree* burns the charred area of the skin is characterized by an *eschar* which is thickened and leathery in appearance. After a week or two *the eschar separates from the skin* to which it had been firmly attached, leaving behind it a seropurulent exudate. When this discharge is cleared away a raw area of granulation tissue may be seen. Gradually this granulation tissue transforms into a scar

Depending on the type of burn constitutional symptoms may be absent or present. In the *milder types* of burn, the patient usually complains of pain. Pain as a rule is absent in severe second and third degree burns. There may be associated tenderness, local discomfort a stinging sensation, some pruritus restlessness, sleeplessness and *fever*

Prognosis.—Hypertrophic scars and keloids are two of the dreaded events that may result from severe third degree burns. Other complications include secondary infection with ulceration at the site of the burned area, bacteremia septicemia tetanus, duodenal (Curling) ulcer pleurisy bronchopneumonia, nephritis meningitis *and erysipelas.*

First and second degree burns heal with reasonable care and mild asepsis to prevent secondary infection. With modern methods of treatment the incidence of serious scar deformity from severe burns has been greatly reduced. Antibiotics in the control of infection and technics for early and successful skin grafting prevent much of the *residual impairment that without* them is inevitable. In deep burns which destroy anatomic structures, some degree of scar deformity of course is inevitable. Martin and Evans state that practically all patients die who have extensive third degree burns (more than 50 per cent of body surface area) despite the alleviation of shock and despite the successful combating of *infection They state further that* any child with a burn of 20 per cent or more of body surface and any adult with a burn of 30 per cent or more should be put on the critical list and the family should be advised of the difficulties and complications which may arise.

Treatment.—*The emergency treatment for* moderately severe and severe burns consists in the *relief of* pain and treatment for shock. Parenteral therapy the use of the corticosteroids, prevention of infection and further care should be carried out according to the accepted principles by the surgeon and the internist. Any infant or child with a burn of 20 per cent or more of *the body surface should be hospitalized* no matter how superficial it is or how good the patient's condition when first seen.

Relief of Pain.—Narcotics are generally indicated for the relief of pain. Codeine sulfate may be given for restlessness, 0.008-0.032 Gm. (1/8-1/2 gr.) depending on the age and weight of the child. Morphine sulfate may be prescribed for severe pain in doses of 0.008-0.016 Gm. (1/8-1/4 gr.) If morphine is required, it should be given intravenously since absorption from other routes is unpredictable and may lead to overdosage. For restlessness small doses of a *barbiturate such as sodium phenobarbital* 0.032-0.045 Gm. (1/2-3/4 gr.) or secobarbital sodium in similar dose may be ordered and repeated every three or four hours.

Treatment of Shock.—Shock usually occurs a half hour after severe burns but it may be delayed for a half to two days. It grows progressively worse as time elapses. Fluid replacement *in the form of whole blood is the remedy* of choice. This particular phase in management is probably best carried out with the joint cooperation of surgeon and internist. It is assumed that a sample of venous blood has been collected for immediate cross matching and the base line hemoglobin, that hematocrit and urinalysis determinations have been made and that *the intravenous administration of* whole blood, pooled plasma, normal saline or 5 per cent glucose in water has been started. These details are generally relegated to the surgeon and internist, who are better prepared to handle these special features than is the dermatologist.

Local Therapy.—Local therapy is not an immediate problem but one that deserves attention *after shock* has been controlled and fluid and electrolyte replacement has been received. The use of old fashioned remedies such as lime *liniment (Carron oil) consisting of equal parts* linseed oil and lime water is to be condemned.

The same condemnation pertains equally for boric acid ointment, greases and many proprietary preparations. Débridement is considered important for optimum therapeutic results. Loose pieces of detached skin may be débrided with a pair of sterile scissors. The detergent of choice is pHisoderm. Dry dressings are to be preferred. In most cases, anesthesia is unnecessary and should be avoided. The same sterile technics are used in the primary dressings as are applied to the care of all open wounds. After adherent clothing and gross dirt have been removed, the burned wound and the adjacent area are gently cleansed with pHisoderm or a bland soap applied with a soft cotton sponge and the ound is irrigated with sterile normal saline. Skin blebs are opened, the raised epithelium is removed and a second flushing with saline is carried out. Petrolatum gauze may be used for burns of the hand involving the fingers; each finger is to be dressed separately. A small amount of sterile petroleum jelly may be used for burns about the lips. For eye burns antibiotic ointment or cortisone ointment is useful. Cortisone treatment for three to five days prior to grafting seems to decrease overgrowth of granulation tissue and to provide better base for the grafting.

See Formulary ℞ 5 wet dressing for first stage: 36, 39 69 for antiphlogistic and healing in subacute stage: 41 for epithelizing ointment in subacute stage.

Sunburn

Sunburn is an inflammatory reaction resulting from exposure of the skin to the actinic (ultraviolet) rays of the sun. Pigmentation or a tanning effect without sunburn is due to a stimulation of the melanin-producing cells. This effect occurs primarily in response to energy in the region of 2900 to 3200 Angstrom units. However in cities the atmosphere filters out all wave lengths less than 900 units. Wave lengths of 2967 units in sunlight cause the maximum amount of burning. The longest wave length capable of producing erythema is 3150 units. Where wav lengths of 450 to 2500 units are present they will cause much less sunburn than those at 2967 units but more than is caused by other wave lengths. Most cases occur in summer

Blonds are more susceptible than brunets because of the deficiency in blood skin of melanin, a light-screening pigment. Nevertheless even Negroes can suffer sunburn under certain conditions. Other predisposing factors include chemicals and substances which may photosensitize the skin, such as fluorescent dyes (brown fluorescin used in certain lipsticks, rhodamine B lithol red used in nail lacquers) oil of bergamot, the juice of figs, buckwheat and certain grasses. Small children burn more easily than adults of light complexion.

In mild sunburn, a slight erythema usually follows within a few hours the exposure of the skin to the direct rays of the sun. Ordinarily the erythema reaches its height from 12 to 4 and sometimes 36 hours after exposure. The redness then subsides and usually some degree of peeling of the skin occurs which in turn is followed by pigmentation. This development usually lasts through one or two weeks. In severe sunburn considerable erythema with edema and vesiculation are present. The lips may be swollen and the eyes may be affected with conjunctivitis. The skin of the face, antecubital areas and legs is most easily affected although the trunk not uncommonly shares also in the inflammatory reaction. In mild and moderate sunburn there may be only slight discomfort of the affected parts. Pain varies with the extent and severity of the burn. Pruritus is nearly always complained of varying from mild to severe. Severe sunburn may be accompanied by constitutional symptoms, including fever chills, headache, delirium and collapse.

At times it might be difficult to differentiate acute sunburn from an early lupus erythematosus, but in the former the follicular plugging, leukopenia and other concomitants of the latter will be lacking. Bathing suit dermatitis and dermatitis venenata due to meadow grass and to chemicals contained in sun tan lotions and creams should be ruled out in differential diagnosis. A history of lying on the grass while in a bathing suit is important in determining that the condition may be a dermatitis venenata due to photosensitization by meadow grass. The posterior area of the body will then be mostly af

fected. In difficult instances patch testing with meadow grasses *may be indicated.* So too in *bathing suit* dermatitis, areas of the body covered by the suit will be affected. If dermatitis venenata caused by chemicals contained in sun tan preparations is suspected, patch testing will generally yield the clue.

Complications include secondary infections in the form of impetigo contagiosa or a frank pyoderma folliculitis infectious eczematoid dermatitis, albuminuria and peripheral neuritis. Diseases that may follow sunburn or be aggravated by sunlight include erythema multiforme lupus erythematosus, urticaria solare, herpes simplex, vitiligo telangiectasia and hydroa aestivale. It should be remembered also that dermatitis venenata may result from remedies used for treatment.

The degree of burn depends on the area exposed the patient's complexion and the duration and intensity of his exposure to the sun's rays. *In general, mild burns heal in a few days* or a week.

Prophylaxis.—The best method of developing *a tan without burning is gradual exposure to* the sun. A chemical light screen prevents passage of most of the burning rays but permits passage of the tanning rays Persons susceptible to solar rays should be advised to take precautionary measures during seasons when the actinic rays are strongest. During sun bathing, susceptible areas of the skin should be protected by bonnets, hoods, long sleeves or gloves. The best colors for protective garments are khaki orange and red least effective is white. The protective value of all fabrics is greatly reduced when they are wet. When such protection is impractical, sun screens should be employed Of the many preparations, para aminobenzoic acid (PABA) quinine salol tannic acid, menthyl salicylate, *titanium doxide in lanolin (hydrous wool fat)* or petrolatum may be prescribed Modern remedies include menthyl anthranilate. butyl benzal acetone oxalate, b-methyl umbelliferone isobutyl para-amino-benzoate benzyl anthranilate and esculetin While all of these newer chemicals may be employed as sun screens, the possibility of sensitizing the skin should be kept in mind

Of the various topical remedies PABA is probably the best It may be prescribed as 15 per cent PABA in a vanishing cream base, alternated with 10 per cent PABA in 70 per cent industrial spirit. It can also be used as a 5-10 per cent solution of PABA in 70 per cent alcohol with good results.

Treatment.—Treatment depends on the severity of the burn. For milder types of sunburn a *mild antiphlogistic ointment should be applied to the affected parts* and further exposure to the actinic rays should be avoided. A standard type of ointment is the following

℞
Bismuth subnitrate 8.0
Zinc oxide ointment
Rose Water Ointment U S.P
(*without rose oil*) aa q.s. 120 0
Misce et fiat unguentum
Signa. Apply freely

For moderate degrees of sunburn when erythema is accompanied by edema, wet dressings should be applied This phase of the treatment is precisely similar to that for any dermatosis characterized by an acute exudative stage. Following subsidence of the acute stage the antiphlogistic ointment cited above may be employed Burow's emulsion is equally effective *The vesicles and bullae of extensive and severe* sunburn should be opened under aseptic conditions and wet dressings applied. A simple bland ointment such as ordinary zinc oxide ointment may then be applied until healing ensues. Com*presses of cold white mineral oil will give more relief in some cases than wet dressings*

See Formulary ℞ 94 95 96 97 sun screens 5 wet dressing 36 39 69 antiphlogistics

Erythema Ab Igne

Erythema ab igne is an inflammatory condition common in persons who are exposed to radiant heat such as from an infra-red lamp hot water bottle, electric pad or the open fireplace. The skin reacts by the presence of a mottled erythema (Fig 140) and pigmentation which may persist for weeks. It is probably due to prolonged vasodilatation *of the skin.* Management consists in avoiding the sources for



Fig. 140.—Erythema ab igne on the right thigh. Note the reticulated erythema. (Courtesy of Dr Alfred B. Falk.)

such exposures and the treatment is the same as for any first degree burn, e g., zinc oxide ointment.

Radiodermatitis

Radiodermatitis is an inflammatory reaction of the skin caused by roentgen ray or radium therapy In the more severe forms of damage the subcutaneous tissue and even the deeper tissues may be affected. The condition may be acute or chronic. Three degrees of acute radiodermatitis are recognized (1) first degree, characterized by erythema and followed by pigmentation, (2) second degree, characterized by vesiculation and (3) third degree, in which there is ulceration.

Some investigators believe that exposure to x-ray in heavy or repeated, excessive or incorrect dosage results in chronic and permanent changes in almost every skin. It is asserted that the largest number of superficial -ray burns arise from the treatment of hypertrichosis and that a number of burns also result from fracture reductions. Excessive exposures have been incurred also in the course of diagnostic procedures and searches for foreign bodies and during radiotherapy for dermatitis. The chief hazard arises when treatment is repeated by a second or third physician without knowledge of prior treatment.

Clinical Picture.—The signs of radiodermatitis as a rule appear slowly The earliest sign is an erythema appearing soon after exposure to radium therapy or to x-rays. This erythema disappears shortly after treatment is given and desquamation of the skin may follow as may also hyperpigmentation. On the other hand the erythema may last for days, weeks or possibly months. Usually at this time the patient complains of a mild pruritus or perhaps of a stinging or pricking sensation of the affected parts. Vesiculation constitutes the so-called second stage. The vesicles may be discrete, disseminated, grouped or confluent. When they rupture they leave a raw oozing surface, which then becomes covered by a yellowish or grayish adherent film consisting of necrotized epithelium and crusts. At this stage, erythema may or may not be present. Eventually the tissue retracts and is replaced by a new smooth, bluish-white epithelium, devoid of pigment. If the areas affected were previously covered with hair there may be permanent alopecia. The "third stage is characterized by ulceration. Ulcers following radiodermatitis are notorious for healing with difficulty indeed they may persist for months and in some instances not heal at all. As a rule the ulcers are painful. Sooner or later thickened and deformed scars appear over which numerous superficial capillaries (telangiectasia) may be seen.

In the chronic form of radiodermatitis the signs do not become apparent for months and sometimes for many years following exposure. The affected areas of the skin are dry wrinkled and telangiectatic with hyperpigmentation or depigmented atrophic scars. Keratoses followed by epitheliomas are frequently seen.

Diagnosis.—Diagnosis is based on a history f roentgen ray or radium exposures and on the clinical signs atrophy telangiectasia (or coal spots") keratosis and carcinoma. Allergic contact dermatitis and *dermatitis* venenata secondary to the use of topical remedies may be confused with radiodermatitis unless they are ruled out by the history patch testing and other appropriate methods. If dermatitis venenata is superimposed on radiodermatitis, the offender may be elicited by the history and the condition cleared with simple use of wet dressings. In an

uncomplicated dermatitis venenata, atrophy and telangiectasia are absent

Complications and Prognosis.—Complications that may occur from radiodermatitis may be both disfiguring and serious. They include atrophy alopecia telangiectasia, pigmentation, depigmentation scars keratoses and cancer The carcinomas are usually squamous cell in type Occasionally however basal squamous lesions metastasize while the basal cell lesions often show "rodent ulcer" characteristics, with deep local invasion.

Prophylaxis and Treatment—It should be emphasized that roentgenotherapy and radiotherapy should be performed only by those who have had special training. Since the effects are cumulative these modalities of therapy should never be used without definite indications.

Treatment of acute radiodermatitis is similar to that of burns (p 366) Keratoses, warts and epithelioma which show evidence of transforming into carcinoma should be destroyed by electrosurgery For the relief of acute pain aloe vera leaf may be helpful and deserves a trial. Plastic surgery may be indicated when there is chronic ulceration.

Acrodynia
(Pink Disease)

Acrodynia is a constitutional disease characterized by irritability profuse sweating, loss of weight and a rash, which usually appears several weeks after onset. In the light of recent investigations it is likely that the disease is due to intoxication from mercury or other heavy metals

Etiology—The disease usually occurs among young infants although occasionally older children are affected. It has been reported that in England and Australia it occurs in the first two years of life, but in Switzerland 60 per cent of 101 acrodynic children observed by Fanconi and Botsztejn in the Children's Hospital of Zurich were over 2 years of age. Both sexes are affected equally There is no seasonal variation In the past many factors have been adduced in the etiology including infection, vitamin deficiency and virus More recently however mercury has been incriminated and what may prove to be confirmatory evidence of its etiologic role has been reported. In most instances the specific sources of mercury have been calomel powders, tablets or worm medicines, ammoniated mercury ointment has also been incriminated and so has a diaper rinse containing bichloride of mercury In most of these patients mercury was found in the urine. However Warkany and Hubbard have pointed out that acrodynic reactions can be brought about in exceptional cases by toxic substances other than mercury and Wiedemann suggests thallium as a possibility

Clinical Picture—The disease begins insidiously and, although the signs and symptoms vary somewhat in infants from older children, the general clinical picture is somewhat alike for both groups. Usually the first thing recognized by parents is a sudden change in the child's disposition. The patient cries more than is usual is irritable, refuses food and is wakeful. These symptoms may continue for a day or perhaps weeks and are the chief reason a physician is finally consulted A gradual loss of weight follows. Bilderback emphasized the five P's which in general characterize the cardinal signs of acrodynia pinkness, peeling paresthesia, perspiration and photophobia.

PINKNESS.—In infants this sign is particularly noticeable on the hands and feet. It is not quite so prominent in older children as it is in those under 2 years of age because the skin of the former is thicker The erythema, particularly noticeable at the ends of the fingers and the toes, frequently involves the palms and soles. Even the tip of the nose and the cheeks may appear red. That these are vasomotor phenomena is obvious in that the hands and feet are cold, clammy moist and swollen. Frequently itching is present manifested by the infant's rubbing his feet or hands together and by scratching. As a rule both hands and feet are affected

PEELING.—The desquamation, starting between the fingers and toes and then spreading to the hands and feet leaves an acute characteristic redness which has been described as raw beef hands and feet. In occasional instances shedding of the nails may occur

PARESTHESIA.—Paresthesia is commonly present.

PERSPIRATION —Excessive sweating, another

feature of acrodynia, becomes marked as the disease progresses. Clinically it results in prickly heat rashes which are not uncommon on the trunk and elsewhere. Involvement of the eccrine glands is found histopathologically by the hypertrophy of those structures.

PHOTOPHOBIA.—Even to the casual examiner this sign at once becomes obvious, for the infant does not wish to be disturbed. Not only is he resentful when he is examined or exposed to light, but his posture is quite characteristic: he burrows his head into the pillow away from light, or he may keep his head between his feet in a so-called "jackknife-like" position when he sits up. On the other hand, infants may bury their heads in their mothers' arms.

Other signs include hypertension (as the disease progresses) and hypotonia (as the muscles become soft and flabby). The temperature may be moderately elevated or may remain within normal range. Gradually all the signs and symptoms subside, the appetite returns and the signs gradually disappear with a restoration to health. Relapses are common, however.

Diagnosis.—The clinical picture is so characteristic in the fully developed case that it is unmistakably diagnostic. It is that of an infant in abject misery wishing to be let alone, refusing food, gradually losing weight, sweating profusely and exhibiting photophobia, peeling of the palms and soles and cyanotic swollen hands and feet, with cold, clammy extremities.

The administration of BAL (dimercaprol) is considered by some authorities to be a diagnostic measure since patients who do not excrete mercury before treatment may eliminate large amounts of it after BAL therapy is instituted. Others suggest that in the absence of history of exposure to mercury, routine and repeated urinalyses for mercury should be performed before exposure can be ruled out.

Pellagra, eczema and scarlet fever may possibly be mistaken for acrodynia but the presence of erythema rather than true rash is an important distinguishing factor and the absence of other characteristics of these diseases will clear up any doubt.

Prognosis and Complications.—The prognosis is generally good. Reports of mortality vary but it probably is about 10 per cent. The disease may last for months or years. Recurrences, while not uncommon, are less frequent with BAL.

Residual neurologic defects and behavior problems have followed after the acute symptoms have subsided. Bronchopneumonia is the chief danger. Diarrhea is occasionally found. Shock and collapse may supervene. Ulcerations may occur at the fingertips and in rare instances gangrene may follow. Upper respiratory infections and acute pharyngitis are common. Pyoderma may follow from scratching. Stomatitis and loss of teeth have been reported and, in older children, loss of hair.

Prophylaxis and Treatment.—In the light of present knowledge presenting the possibility that mercury may be an etiologic factor, all forms of mercury should be avoided so far as is possible. This statement holds particularly true of teething powders and the use of protoiodide of mercury for the treatment of warts per os. The use of bichloride of mercury rinses for the prevention of ammoniacal dermatitis is no longer indicated in view of the more modern developments for treating diaper rash. Ammoniated mercury ointment may be replaced by the even more effective modern antibiotics for the treatment of impetigo contagiosa and pyoderma.

When mercurial intoxication or intoxication by other heavy metals is suspected or definitely found to be responsible for acrodynia, BAL should be given a trial. A safe rule for dosage is 1.7 mg. of BAL per kg. of body weight. BAL should be given intramuscularly at four-hour intervals and continued until improvement occurs.

Soothing baths of starch or Aveeno are serviceable for the acute inflammatory stage and for miliaria. Sponging with witch hazel water or evaporating lotions and the use of dusting powders may be indicated.

For sleeplessness and restlessness, phenobarbital or chloral hydrate by mouth or rectum should be prescribed.

Beryllium Granuloma

From the pediatric dermatologic point of view the subcutaneous beryllium granuloma is an important lesion. It is caused by a cut from a broken fluorescent lamp and contact with zinc manganese beryllium silicate, the phosphor

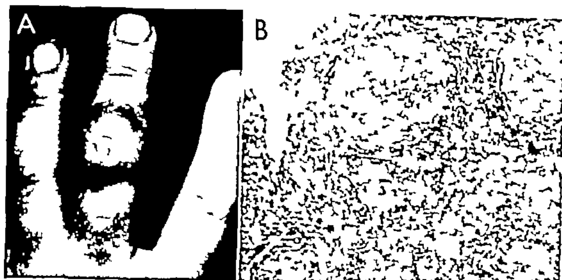


Fig. 141.—Beryllium granuloma in a boy 7 years of age. In **A**, the indurated, swollen, chronically inflamed area of the finger marks the site of laceration with a fluorescent lamp fragment. In the histopathologic section (**B**) the epithelioid cells form small granulomas strikingly similar to those found in tuberculous lesions. (From Cooper D and Grimes, O F California Med. 74 203 March, 1951)

with which the inside of such lamps is covered

Several types of lesions have been described. A contact dermatitis has been reported among workers in beryllium after exposure to dust and fumes of beryllium sulfate fluoride and oxyfluoride. The same investigators reported ulcers resulting from the implantation of crystals of beryllium sulfate in a laceration which did not heal unless the crystal of beryllium was removed. The cutaneous lesions which develop in patients with pulmonary granulomatosis and which are believed to be part of a generalized disease are not seen in children.

The *clinical picture* is that of a slowly and improperly healing wound with swelling (Fig. 141 *A*) tenderness, intermittent pain and frequent ulceration following a skin laceration by fluorescent bulb fragments. Often the history is that the injury from a broken fluorescent bulb occurred two to four years ago The wound heals slowly and presents a reddish raised appearance ("proud flesh") and clears only to flare up again. When the laceration heals painful nodules may then occur and there may be an intermittent discharge from the scar as from a foreign body irritation

Diagnosis is based on the history the clinical picture of granulomatous lesions that fail to heal completely the repeated flare-ups and the histopathologic picture of the lesions (Fig. 141 *B*) which resembles that of Boeck's sarcoid. Demonstration of beryllium in the skin by spectroscopic examination is conclusively diagnostic. There are no complications. The *prognosis* is good provided the beryllium granules are removed.

Treatment is entirely surgical and consists of wide excision of the affected area and curettage.

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25

Congenital Anomalies

THE CONGENITAL anomalies discussed in this chapter are the more important ones grouped together for the sake of ease of reference. They include nevi and angiomas, ichthyosis, congenital ichthyosiform erythroderma keratosis pilaris, keratosis follicularis keratosis palmaris et plantaris lichen spinulosus, hereditary ectodermal dysplasia, epidermolysis bullosa, pachyonychia congenita incontinentia pigmenti, cutis hyperelastica and cutis laxa, pseudo-ainhum cystic hygroma of the neck multiple benign cystic epithelioma, adenoma sebaceum and neurofibromatosis. A number of other defects are discussed in more appropriate chapters for example, scrotal tongue in Chapter 30 Diseases of the Mouth and Tongue monilethrix and anonychia in Chapter 28 Diseases of the Hair and Nails

Nevi and Angiomas

(Birthmarks)

The term nevus" is Latin and means blemish or mark. It has been applied indiscriminately to all birthmarks but confusion can be avoided if its use is confined to the nonvascular and pigmented types and the term angioma" is applied to the vascular and lymphatic types

In the management of nevi and angioma certain principles should be kept in mind so that tragic cosmetic results may not occur from ultraconservative treatment, from too zealous attempts at treatment, or from treatment by persons unskilled in various modalities Some birthmarks disappear spontaneously if they are left untreated even for as long as five years. Some of the vascular types, however may enlarge and rupture and then either disappear with or without scarring or else be followed by copious and even fatal hemorrhage I have seen some sad cases in which plastic surgery was required to correct disfigurement resulting from spontaneous cures" of angiomas of the face. Lesions upon the covered regions of the body may be let alone for a five-year period but carefully watched if at any time rapid growth starts they should then be removed at once. As a rule, localized lesions are amenable to therapy extensive ones generally are not. It should be remembered also that it is best to treat such lesions at an early age when scar tissue comes in lighter

The clinician s judgment is of paramount importance. Equally important is the fact, which cannot be overemphasized that unless he has had special training in the various therapeutic modalities, the physician should never undertake the treatment of nevi and angiomas. When removal of the lesion is indicated, the aim of the therapist should be to obtain both a good therapeutic and a pleasing cosmetic result, avoiding ugly and disfiguring scars insofar as possible. Unskilled treatment may produce unfortunate psychologic effects especially in the teens.

Nevi

VERRUCOUS (WARTY) NEVI.—These are hard, various sized lesions, either localized to certain

areas or widespread. They frequently assume a linear distribution and often follow the course of a nerve (nevus unis lateris). The well known horny generalized arrangement seen on the



Fig. 142.—Verrucous nevus, present since birth in a boy 5½ years of age. The lesions were arranged in a linear pattern on the trunk and in grape-like clusters on the right side of the neck. Biopsy from lesions on the neck was reported as intraepidermic epithelial nevus.

trunk or extremities is known as ichthyosis hystrix. Verrucous nevi are generally devoid of hair and may be pigmented (Fig. 142). Histopathologic changes are generally limited to the epidermis. They are benign lesions. When small they may be let alone, except perhaps in areas subject to trauma. They are best removed by electrolysis or excised surgically. Smaller lesions may be electrodesiccated or treated with dry ice. These lesions should be removed at skin level, not deeper, for a good cosmetic effect.

Intraepidermal nevi.—The common mole or intraepidermic nevus occurs as a slightly or considerably elevated, soft, dark or light reddish-brown lesion on the face or elsewhere on the body (Fig. 143). Occasionally when they become fibrotic they may appear hard. Moles usually contain a number of hairs or a single hair but may be quite hairy or entirely devoid of hair. They may be smooth, sharply demarcated and either round or oval. Pigmented moles are seldom present at birth.

The safest, easiest and surest method for eradicating such lesions is by electrodesiccation followed by curetting, or by curette alone. Desiccation renders the operation less bloody. The next best method is radium or roentgen therapy. Surgical excision often yields good results but in most cases is entirely unnecessary. Some dermatologists obtain good results by the application of dry ice for 5 seconds with deep pressure, repeated several times. When hairs are present they should be removed by electrolysis.

Nevus anemicus (nevus avasculosus) —This occurs as a circumscribed or bandlike, whitish discoloration of the skin. It is due to



Fig. 143.—Intraepidermic epithelial nevus, confirmed by biopsy in a girl 14 years of age. The solitary reddish brown, raised lesion resembles a mulberry. On close inspection small cup-shaped nodules with their concavities directed upward may be seen, suggesting a grouping of the raised papules which appear confluent. (Courtesy of Dr Irwin I. Lubowe, New York Medical College, Metropolitan Hospital Center, New York.)

lack of pigment resulting from absence of blood. Such lesions are generally seen upon the upper posterior area of the chest. When located on hairy parts of the skin, the hair also is white. Size varies; some are as large as a small orange. Nevus anemicus must be differentiated from



Fig 144 —Blue nevus In this classical histopathologic specimen can be seen the spindle-shaped melanoblasts containing melanin grouped in the form of irregular bundles in the middle and lower third of the corium.

vitiligo in which the border of the depigmented lesion is frequently hyperpigmented. Brisk rubbing accentuates the whiteness of nevus anemicus in contrast to the pinkness of the normal skin, but vitiliginous areas become pinkish or red when rubbed.

Treatment is of no avail and the lesions are best let alone. Walnut stain or a weak solution of potassium permanganate has been used to cover the lesions. Covermark is useful.

SEBACEOUS NEVUS.—These nevi, composed of sebaceous glands, may be seen on the face, the scalp and the dorsal aspects of the trunk. Although relatively common in childhood, they are seen far more often in adults. Clinically they appear as lobulated, soft, yellowish elevations on the skin. They may be singular or multiple and are generally protuberant. The best treatment is excision. When many such lesions are present electrodesiccation is the treatment of choice.

BLUE NEVUS.—The blue nevus is a deep lesion, with the nevus cells deep in the cutis (Fig. 144) It is often mistaken for a vascular lesion. They are purplish in color but they may be brown, slate black or bluish black. The blue nevus is perhaps best let alone. Treatment, when elected, should be by surgical incision with scalpel or electric cutting current. Radium and x-ray irradiation freezing and chemical treatment are definitely contraindicated. Since dry ice acts only superficially it is valueless as a therapeutic agent.

The *Mongolian spot* known to pediatricians, is a variety of blue nevus which appears as a bluish to dark bluish macule or macules of considerable size, is present at birth and is commonly located over the sacral area or the buttocks (Fig. 145) although occasionally other regions of the trunk may be involved. They usually disappear as the child grows older but they may persist throughout life.

JUNCTION NEVUS.—"Junction nevus" is a loose term for a lesion that occurs specifically at the epidermal-dermal junction In fact, it is most active at the margin of the epidermis and cutis.

Clinically it is tiny smooth, pigmented, nonhairy (except in hairy regions) and nonwarty innocent looking mark. Rarely the lesions are nonpigmented sometimes they are soft and warty. The junction nevus may appear at any age and is not always present at birth. Junction nevi include some of the lentigines, especially lentigo maligna, nevus spilus, nevus pigmentosus, and those in which the changes are taking place at nile warts and adenoma sebaceum. The color and distribution will aid in differentiation from *juvenile warts*, in which the papules are skin colored, with slightly flattened and roughened surfaces, and often appear on the dorsal surfaces of the hands as well as on the face, and from *adenoma sebaceum*, in which the papules are yellowish red and waxy located on the flush areas of the cheeks, are often associated



Fig. 145.—Mongolian spot in an infant 6 weeks of age. Note the macules (which were bluish) on each side of the intergluteal cleft. They had been present since birth.

the epidermal-dermal junction. Often it is the forerunner of malignant melanoma.

Complete excision is the only treatment. A junction nevus should never be irradiated or treated with chemicals or carbon dioxide snow.

Dermatosis papulosa nigra.—This cutaneous eruption, probably nevoid in origin, is commonly seen in Negroes. The lesions consist of minute, hyperpigmented papules, discrete, rounded, spindle-shaped or angular. Common sites are the face and eyelids. One of this author's cases was in a colored infant in whom the lesions appeared on the lateral aspect of the neck. The condition develops before puberty usually at an early age, and is apparently more common in females. The clinical characteristics are quite diagnostic. Nevertheless, the papules may be confused with those of juvewith papillary telangiectasis and other congenital anomalies and may not appear until adolescence.

The nevoid lesions may be removed by light electrodesiccation for cosmetic effect.

Other nevi.—A hairy mole is also known as a *nevus pilosus* and a pigmented mole as *nevus pigmentosus*. As the term indicates, then, *nevus pigmentosus et pilosus* is a mole that is both pigmented and hairy (Fig. 146). The presence of hair follicles can be demonstrated on histopathologic examination. There are many variations in size, pigment and clinical appearance of soft moles. The pigmented hairy mole localized to the lower half of the abdomen is referred to as the bathing trunk type because it is over the region covered by a man's bathing trunks.

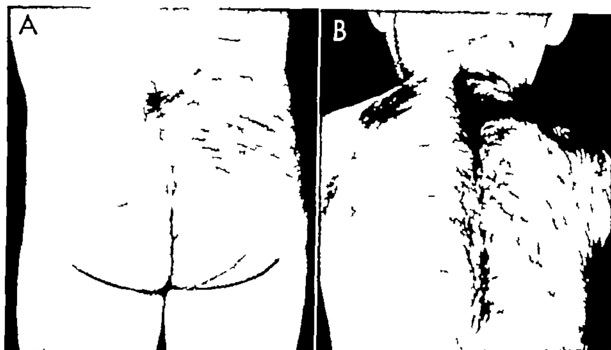


Fig 146.—Nevus pigmentosus et pilosus. A In an infant B In a boy (*B* courtesy of Dr Meyer L Niedelman.)

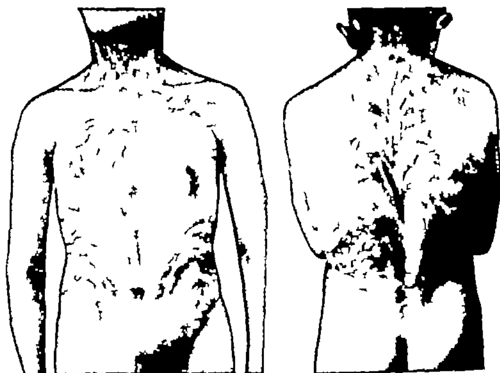


Fig 147.—Systematized nevus in a boy 10 years of age. (Courtesy of Dr Herbert M Leavitt.)

Extensive pigmentation may be seen covering the front and back of the trunk without the presence of hair The patterns are usually symmetrical and the lesion is referred to as *extensive systematized nevus* (Fig. 147)

When hairs are comparatively few in number they may be removed by electrolysis. For more extensive types of nevus, surgical excision may become necessary

Angiomas

Spider nevus (nevus araneus) —This nevus, frequently seen on the face, is a small dilated, elevated papule or tumor with numerous dilated capillaries radiating from it like the legs of a spider (Fig. 148) The lesions may be single or multiple and may appear at any age. They may also be seen on the back of the hands, fore arms, neck and occasionally on the upper part of the chest. They can be differentiated from *petechiae* by the fact that the latter disappear on diascopic pressure while the former do not.

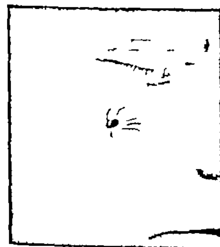


Fig. 148.—Spider nevus. Numerous fine blood vessels radiate from the levated nodule lik the legs of spider (Courtesy of Dr Alfred B Falk.)

The lesions of spider nevi resemble *hereditary hemorrhagic telangiectasia* (Rendu-Osler Weber disease) but in the latter rare, inherited and familial disease the small telangiectatic blood vessels upon the kin and mucous membranes may be few or many coughing, sneezing or bowel movement may induce profuse hemorrhages, and histologic examination of the capillary will disclose a single layer of endothelial cells.

The object in treatment is to produce a thrombosis at the central point of the nevus. The



Fig. 149.—Nevus flammeus. (Courtesy of Dr John C. Belisario. Photography by Mr Wood and Smith, Department of Artistry University of Sydney)

best method is electrolysis or electrodesiccation with cautery point, hot enough to char a tongue depressor applied to the center of the nevus; or the point may be sparked by means of a diathermy machine sufficiently to blanch the lesions (1 ma. galvanic current) One such treat ment is usually sufficient although a second one may be necessary

Port wine mark (nevus flammeus) —This very common nevus is a macular lesion seen usually on the face (Fig. 149) neck, root f the nose and upper eyelids. It varies in size from dime to a half dollar (1 73 to 3.0? cm.) but may be even larger Occasionally extensive areas of the skin are involved, even an entire side of the body the head, neck and upper ex tremities. The light port-wine or reddish-purple color intensifies during crying spells. Linear (zosteriform) distribution at times is seen t birth upon the extremities and the nape of the

neck but it then tends to disappear completely

It is my opinion that the port wine mark nevus is best let alone. Extensive areas may be camouflaged with Covermark. Occasionally good results may be obtained with repeated applications of dry ice or a blistering dose of ultraviolet radiation Bucky has claimed good results from the use of grenz rays.

STRAWBERRY MARK.—This is a capillary hemangioma which, in contrast to the cavernous hemangioma, is superficial It consists of small superficial vascular lesions, bright or dark red in color definitely but slightly raised above the skin surface and more or less finely lobulated



Fig. 150.—Strawberry angioma. (Courtesy of Dr Meyer L. Niedelman.)

(Fig 150) Generally the texture resembles the surface of a strawberry or raspberry At times it appears as a cluster of minute, closely packed pinhead lesions which after several weeks attain a characteristic size and appearance. It blanches upon pressure It may occur anywhere on the skin Capillary hemangiomas and lymphangiomas sometimes occur simultaneously and often disappear spontaneously

Small and moderate sized strawberry marks respond nicely to localized applications of carbon dioxide snow under moderate pressure for 15 to 30 seconds and repeated at weekly intervals or every second week. Sterile applications of petrolatum should be made after rupture of the blister which follows such applications. Sclerosing solutions may be used. If radium or roentgen ray therapy is required, it should be carried out only by those skilled in its use.

CAVERNOUS ANGIOMA.—This is the angioma most commonly found at birth. It is a vascular tumor sometimes as large as an orange or small grapefruit (Fig. 151) Deep-seated, it appears anywhere on the skin, even the mouth and external genitalia On the other hand it may appear slightly elevated above the skin surface, not unlike a strawberry mark, or even flat. It often possesses a cystic feel, not unlike a bag of worms, particularly the larger lesions appearing on the chest. The color varies from red to blue depending on the extent and location of the lesions It may appear weeks or months after birth and at times it grows rapidly There are sometimes subjective symptoms of pain, especially with lesions on an extremity that hurt particularly after exercise.

A cavernous angioma on the frontal area of the scalp especially when located at the root of the nose, must be differentiated from *encephalocele* Reports are on record of encephaloceles that, mistaken for angioma, have been incised with resulting fatal hemorrhage. An encephalocele may be recognized by its lobulated appearance. When the infant or child cries, the area becomes more distended than does that of a vascular nevus.

In the treatment of cavernous angiomas, radium needles or application of radon yield excellent results. Sclerosing agents are of definite value, especially for the larger types. A number of sclerosing agents have been recommended, but sodium morrhuate is definitely contraindicated because of the danger of embolism Quinine and urea hydrochloride may be used in dose of 2 cc. mixed with an equal amount of saline solution or alone in concentrated strength. The important procedural point in injecting the sclerosing agent is to penetrate the depth of the angioma Two or three different sites are generally selected the needle is inserted and the solution is injected directly into the lesion This procedure should be repeated every few weeks until the angioma has disappeared.

A useful sclerosing agent is Sotradecol marketed for this purpose in 1 and 3 per cent solu-

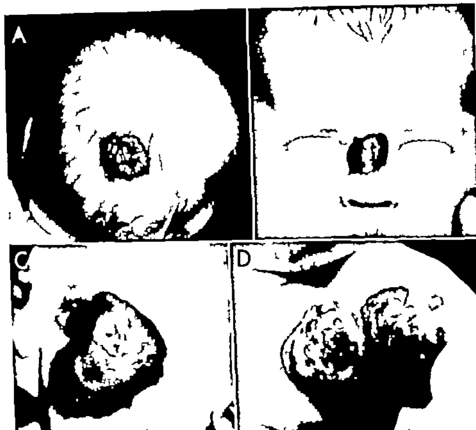


Fig. 151.—Cavernous angioma. A, B and C are superficial, D is combined superficial and deep cavernous angioma. (*A* and *D* courtesy of Dr John S. Belisario. Photography by Mr. Woodward Smith, Department of Artistry University of Sydney *B* courtesy of Dr Meyer L. Niedelman and *C* courtesy of Dr C. S. Wright and Dr R. Friedman.)

tions. Approximately 1 cc. is injected into the angioma. The treatment is repeated in week's time and every two weeks thereafter until the angioma has disappeared. After each treatment the area is covered with several layers of sterile gauze and adhesive.

CAVERNOUS LYMPHANGIOMA.—This, the commonest type of lymphangioma, consists of dilated lymphatic sinuses filled with lymph or a mixture of lymph and blood (hemolymphangioma). It occurs most commonly on the skin and in the subcutaneous tissues, generally on the face and perhaps involving the mucous membranes of the mouth and tongue. The skin may appear normal or the lesion may present numerous papules and thick-walled vesicles (nevus lymphangiectodes).

Cavernous lymphangioma should be differentiated from a diffuse cavernous hemangioma. The differentiating point is that hemangiomas are not characterized by the papulovesicular elements which are common in cavernous lymphangiomas.

The best treatment is surgical excision. Keloids may follow.

ANGIOMA SERPIGINOSUM.—Angioma serpiginosum (Fig. 152) is a tumor of the terminal blood vessels. Clinically the lesions appear as minute vesicular puncta resembling grains of cayenne pepper arranged in a circinate pattern on the skin.

MIXED TYPES.—All kinds of combinations are possible and are not rare in infants and children. For example the port-wine mark may be

found with a strawberry hemangioma and lymph vessels may share in the clinical picture (hemangiolymphangioma) Difficulty in differential diagnosis arises in the mixed types and often



Fig 152.—Angioma serpiginosum on the lower extremity of a child It is characterized by numerous red puncta some of which are papular Some of the lesions have undergone slight lichenification and scaling (Courtesy of Dr Alfred B Falk)

histopathologic study of biopsy specimens is required to determine their true nature.

Sturge-Weber Dimitri Disease

This comparatively rare condition is characterized by the association of skin nevi and hemangioma of the brain. The angiomatous malformation is considered a congenital dysplasia rather than a true neoplasm It is regarded as a mesodermal defect the result of some unknown trauma sustained in early fetal life.

Symptoms as a rule are noted in early infancy or early childhood and are mostly neurologic and ocular Generalized or jacksonian convulsions occur in 75 per cent of cases. Spastic paralysis occurs on the side opposite to the affected leptomeninges. There is usually mental retardation or complete amentia. Ocular abnormalities, usually unilateral are encountered in about 70 per cent of cases.

Skin nevus or angioma (Figs. 153 154) usually unilateral and rarely crossing the midline, is a paramount symptom The lesion characteristically follows the distribution of the branches of the fifth cranial nerve. It generally has a portwine color but at times it may be pale or barely noticeable. The skin lesion varies in size from that of a pinhead to an extensive lesion involving the head neck, oral mucosa, tongue, palate and the greater part of the body Occasionally both sides of the face may be involved

Roentgenologic studies (Fig. 154) show shadows of mineral deposits (usually calcium salts) observed chiefly in the occipital lobes. The prognosis is poor Most patients die in the second or third decade usually from some intercurrent infection Treatment is symptomatic and palliative. Attempts to remove the lesion surgically or to treat it with x-ray or by both means have failed.

Ichthyosis

(Fish Skin Disease)

Ichthyosis is a congenital disease of unknown origin usually hereditary and characterized by a thick platelike hypertrophy (or hyperkeratosis) of the horny layer of the skin usually of the entire body There are four types ichthyosis fetalis (or congenita) ichthyosis simplex ichthyosis hystrix and ichthyosis follicularis, which is rare. The term ichthyosis congenita larvata" describes the relatively less severe cases which appear at birth with the skin more or less covered with a thin collodion-like film. The term ichthyosis congenita tarda" describes cases in which there is slight evidence of ichthyosis at birth but with anomalies appearing after a few days, weeks or months.

Etiology—The cause is unknown A hereditary tendency has been noted. Several members of a family may be affected but the disease is

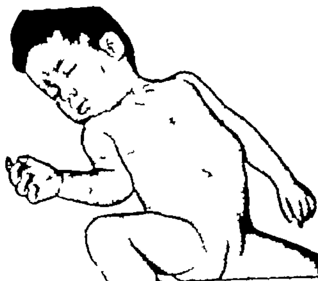


Fig. 153 —Sturge Weber Dimitri disease Pneumoencephalogram showed localized brain atrophy (Courtesy of Dr Meyer L Niedelman)





Fig. 154 —Sturge Weber-Dimitri disease. The patient had a contralateral weakness and paralysis of the upper extremity He also had convulsions. There were homolateral changes in the brain. Pneumoencephalogram showed mineral deposits. (Courtesy of Dr Thomas Butterworth)

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Ichthyosis is a congenital disease of unknown origin usually hereditary and characterized by *a thick platelike hypertrophy (or hyperkeratosis)* of the horny layer of the skin, usually of the entire body There are four types ichthyosis fetalis (or congenita) ichthyosis simplex ichthyosis hystrix and ichthyosis follicularis, which is rare. The term ichthyosis congenita larvata describes the relatively less severe cases which appear at birth with the skin more or less covered with a thin collodion-like film The term ichthyosis congenita tarda describes cases *in* which there is slight evidence of ichthyosis at birth *but with anomalies* appearing after a few days, weeks or months.

Etiology—The cause is unknown. A hereditary tendency has been noted. Several members *of a family may be affected* but the disease is

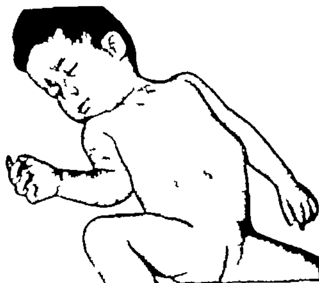


Fig. 153 —Sturge Weber Dimitri disease. Pneumoencephalogram showed localized brain atrophy (Courtesy of Dr Meyer L. Niedelman.)





Fig. 154 —Sturge-Weber Dimitri disease. The patient had a contralateral weakness and paralysis of the upper extremity He also had convulsions. There were homolateral changes in the brain. Pneumoencephalogram showed mineral deposits. (Courtesy of Dr Thomas Butterworth.)

known to skip several generations. The so-called "harlequin fetus Is the only type in which changes occur in utero It has been estimated that *approximately 25 per cent of cases* are hereditary and 50 per cent are familial

Clinical Picture—ICHTHYOSIS FETALIS (ICHTHYOSIS CONGENITA) —Three types of ichthyosis fetalis are recognized clinically gravis, medium and benign. *Ichthyosis gravis is characterized* by thickened, armor like plates of the flees are not uncommon caused by contractures. The auricula or pinna of the external ears, usually thickened and deformed may be attached to the sides of the head. The nails and hair may be imperfectly developed and brittle. The hands and feet are yellowish white and smooth, appearing to be carved in wax. The fingers and toes are fixed in a flexed position. The parchment like appearance of the skin, deformities of the mouth and ears and ectropion of the eyes



Fig 155.—Congenital ichthyosis. (By permission from Robinson Saul S. Southwestern Medicine 21 41-44 February 1937)

stratum corneum together with abnormalities of the eyes ears mouth and extremities. This type is associated with a high mortality Death occurs a few hours or days after birth, caused by the infant s inability to nurse and its immobility In the worst form the skin of the trunk is thick and horny resembling parchment or collodion. Various descriptive terms have been applied to its appearance e.g. a baked apple, a suckling pig, 'morocco leather and "the bark of a tree On extension of the extremities, the *skin crinkles like heavy parchment or* thickened collodion and when flexed shallow fissures are produced. The eyes are usually in a condition of ectropion and the nostrils may be occluded by excessive production of epithelial cells. Deformities of the mouth and other ori give the infant a clownish appearance, hence the term "harlequin fetus.

The *mild or benign* type is sometimes referred to as ichthyosis fetalis mitior The entire surface of the skin from head to upper and lower extremities including the trunk, is covered by a thin collodion-like or parchment like membrane, of a dull reddish-brown color and forming a pellicle or covering, as it were, over the entire body Wrinkling of the skin is especially noticeable over the flexures and buttocks. *After several days fissures appear* and desquamation follows (Fig. 155) The varnish like membranes, disappearing, leave behind an apparently normal skin with perhaps a slight redness resembling that of the skin of a newborn infant. The general nutrition and vitality of the

infant remain normal. However some investigators refuse to accept this type as a true ichthyosis. Indeed between the severe (gravis) type and the mild (benign) form all kinds of variations have been described.

ICHTHYOSIS SIMPLEX (ICHTHYOSIS VULGARIS) —This type may be either mild or severe. In its simplest form it is known as xeroderma (xerosis) The skin is dry rough and covered with slight, fine, furfuraceous scales. Usually the scales are found on the extensor surfaces of the upper and lower extremities, but they may be more or less generalized on the trunk. Unusual thickening of the skin occurs over the elbows and knees, with the lesions symmetrically distributed. Sometimes an unusual roughness of the skin is also noted upon the anterolateral aspects of the arms and thighs. Upon closer examination these lesions are found to consist of keratotic papules that, taken together resemble the surface of a nutmeg grater (Fig. 156) In short, keratosis pilaris associated with grayish discoloration. Quadrangular or diamond-shaped disks are characteristic, with the scale free at the edges but attached at the center The lesions are sparser on the face; on the scalp they may resemble a seborrheic dermatitis. The palms and soles are unusually dry and wrinkled. The mucous membranes are free of lesions. The nails are normal. Depending upon the clinical characteristics of the ichthyotic skin, various descriptive terms have been adopted into common usage. Thus, "ichthyosis nitida describes the condition when the scales are thin, silver like, shiny and translucent, "ichthyosis nigricans when the scales have a dark appearance brown to black, ichthyosis serpentina when the scales are polygonal and snake-like, ichthyosis sauriasis (sauroderma) when the scales, considerably thickened, resemble crocodile skin and "ichthyosis hystrix when the horny protuberances are verrucous or pointed outgrowths resembling the coat of a porcupine.

Interesting is the fact that ichthyotic patients are better in summer than in winter Although ichthyotic patients sweat little or not at all, strenuous work or exercise which causes slight perspiration tends to improve their condition. Itching is absent. Ichthyosis simplex may occur several months following birth or even years later

ICHTHYOSIS HYSTRIX ("porcupine men) — This term is used for those cases characterized by circumscribed plaques or patches of spinous outgrowths or by warty (Fig. 157) or papular lesions. A comparatively rare type, it may at times be difficult to differentiate from linear nevus or ystematized nevus.

ICHTHYOSIS FOLLICULARIS.—This type of ichthyosis is rare. Some investigators are of the opinion that it is keratosis pilaris (p.388) in a severe form. As a result of the follicular ele



Fig. 156.—Ichthyosis vulgaris. Note the alligator-like skin. (Courtesy of Dr John C. Belisario. Photography by M Woodward Smith, Department of Artistry University of Sydney)

ment there is an associated alopecia and eyebrows and eyelashes are absent. The areas of predilection the extensor surfaces of the upper arms, sides of neck and back of trunk, generally exhibit papules symmetrically distributed



Fig 157.—Ichthyosis hystrix. Lesions were limited to the legs. (Courtesy of Dr R. Friedman.)

Diagnosis.—A familial history of heredity is frequently elicited. Ichthyosis usually appears in the early years. The epidermis becomes dry brittle and parchment like. The fullblown picture consists of thickened polygonal scales (diamond-shaped disks) forming a true mosaic like pattern over the extensor surfaces of the extremities and the greater part of the trunk. In ichthyosis hystrix, warty and spinous projections are seen

Differential Diagnosis.—Ichthyosis congenita can be differentiated from *dermatitis exfoliativa neonatorum* (Ritter's disease) by the fact that the latter is characterized by a generalized exfoliative dermatitis which usually appears between the first and third weeks after birth, sometimes with vesicles and bullae and accompanied by prostration It can be differentiated from *congenital syphilis* by the absence of the other signs and symptoms of syphilis, such as bullae on the palms and soles, syphilitic rhinitis, condylomatas about the anogenital region, enlarged liver and spleen, and by the appropriate laboratory examinations.

Ichthyosis simplex can be differentiated from *erythroderma ichthyosiforme congenitale* by the lack of intense redness characterizing the latter as well as by the distribution. Also useful in differential diagnosis are the facts that in *psoriasis* the hyperkeratotic scales when removed show bleeding points and many of the lesions are erythematous in *atopic dermatitis* (dry type) the skin is red and does not show the diamond-shaped disks characteristic of ichthyosis, and in *pityriasis rubra pilaris* the skin is bright red.

Complications and Prognosis.—Secondary infection (pyoderma) is commonly seen Eczematization, another common complication, can be very resistant to therapy Congenital ichthyosis is occasionally found associated with idiocy infantilism epilepsy arachnodactyly and retinitis pigmentosa. These are referred to as the syndrome of Rud.

The truism once ichthyotic, always ichthyotic probably describes the course one may expect in the disease. Ichthyosis fetalis of the gravis type is invariably fatal. The prematurity of most of these infants adds to the high mortality Prognosis of the mild form of fetal ichthyosis is good insofar as life is concerned, but poor insofar as concerns a complete cure Some patients improve with time some remain unchanged and in others the condition may even grow worse with the years. Ichthyosis simplex occasionally improves at the time of puberty but it rarely disappears. In brief ichthyosis is usually a lifelong disease.

Prophylaxis and Treatment.—The only safeguard against the disease is avoidance of consanguinity of marriage.

Treatment is entirely symptomatic. There is no known specific therapy Glandular extracts, particularly desiccated thyroid extract have been used but in most instances without success. Vitamin A has not proved beneficial.

Keratolytics are indicated to soften and remove the thickened scales. This is accomplished by daily warm baths with green soap (Medicinal Soft Soap U.S.P.). Following the bath, a 5 per cent salicylic acid in petrolatum may be applied to the skin. Such baths, after being continued for one week, should be followed by one day of rest. Inunctions with animal fats such as goose grease are often helpful in keeping the skin soft.

See Formulary ℞ 6, as keratolytic bath (add 3 fl. oz. [100 cc.] to bath) 35 as keratolytic; 88 as emollient, 118, for ichthyosis associated with low basal metabolism (dose dependent on age)

Congenital Ichthyosiform Erythroderma
(Erythroderma Ichthyosiforme Congenitum)

This condition is an ectodermal defect occurring at birth or soon thereafter characterized by generalized redness and hyperkeratoses. Some dermatologists believe that it is a variant of ichthyosis vulgaris. It has been divided into three groups dry or wet (bullous) generalized or circumscribed and classic or traditional.

The exact cause is unknown. Heredity apparently does not play exactly the same role in this disease as in ichthyosis vulgaris although a distinct familial tendency does exist. It is seen in males as often as in females. However Wile, finding the affection occurring exclusively in male children in his series, has stated that it illustrates sex limitations in recessive inheritance Accordingly he believes that this condition is transmitted as a recessive hereditary characteristic whereas true ichthyosis is more often a directly transmitted hereditary trait.

Clinical Picture.—The condition is present at birth or appears few days later It appears less frequently during early childhood and rarely even at puberty Two f its characteristic features are the generalized hyperkeratosis and the erythroderma, which vary from case to case in intensity and distribution. The outstanding sign is the erythroderma, which may be mild or pronounced and is more or less generalized. Although occasionally the redness may be minimal or hardly noticeable it is the one characteristic feature

The ichthyotic element is quite apparent and may even precede the erythroderma. As time passes, the erythroderma skin becomes thickened and scaly while the redness gradually fades and may in fact, completely disappear especially during the later years of puberty or when adulthood is reached. In keeping with this change, the dry scaly character of the skin may also show improvement, but *never to the point* of complete disappearance; the ichthyotic component always remains. The hyperkeratosis varies from a mild xerosis to a hystrix type. The lesions are more or less generalized and symmetrical in distribution, but the maximum intensity of the ichthyotic lichenification is to be seen at the flexures, at the antecubital areas, in the popliteal areas and at the axillae. This of course, is in direct contrast to the ichthyotic changes in ichthyosis vulgaris, in which the extensors are mostly involved while the flexure surfaces are usually free from lesions.

The scalp and face as a rule show some erythema and are scaly (seborrhea) *Ectropion* is not an uncommon finding. The palms and soles may be *free of* lesions or keratotic. It has been stated that appendages such as the hair of the scalp and body and the nails, may show unusual growth, on the other hand, they may be retarded in growth (agenesia) Several instances have been recorded in which the condition is accompanied by bullae on the extremities, especially during the cold seasons. Pruritus may be of sufficient severity to prevent sleep but generally the health is good and there are no subjective symptoms.

Diagnosis.—The diagnostic features consist of generalized hyperkeratosis and erythroderma, present at birth or appearing soon after The flexural surfaces rather than the extensor are f fected usually

Ordinarily there is no difficulty in differentiating congenital ichthyosiform erythroderma from *ichthyosis vulgaris* since in the former condition the chief feature is the involvement of the flexures, areas of the skin which are spared in ichthyosis vulgaris. Both ichthyosis vulgaris and congenital ichthyosiform erythroderma generally improve during the summer months, but *the diamond-shaped* disks never disappear However during the summer months the features of the lesions in congenital ichthyosiform erythroderma may be so completely lost

as to render clinical diagnosis impossible Particular difficulties of diagnosis are encountered in those cases of ichthyosis vulgaris in which the erythrodermic changes appear secondary to trauma and local irritation but interrogation of the parents will reveal the erythroderma to be of recent origin and to have followed secondary irritation.

Complications and Prognosis.—Ectodermal defects may be associated with the disease. The occurrence of bullous lesions has already been mentioned Eczematous neurodermatitic secondary changes are common. Improvement is generally noticed during the summer months

Treatment—Occasional good results have been obtained from small doses of thyroid, which may be prescribed in dosage of ⅛ gr (8 mg) once daily for infants and from ¼ ½ gr (16-32 mg.) once daily for children. This treatment may be continued for several months. Pilocarpine is valueless

Topical therapy consists in the use of keratoplastics, keratolytics and, when itching is present antipruritics. Of the various animal fats goose grease and benzoinated lard are sometimes helpful Of the fixed oils expressed oil of almond and olive oil may be given a trial One to two per cent salicylic acid may be incorporated in either of the oils. Cacao butter (Theobroma Oil U.S P) and yellow petrolatum are preferred as emollients by some dermatologists. Oatmeal baths, Aveeno and starch baths are helpful Strong alkali soaps and water should be avoided. Antipruritics, such as 0.25–1 0 per cent of phenol or 0 1 per cent menthol singly or combined may be added to emulsions, such as an emulsion of equal parts of olive oil and lime water

See Formulary ℞ 88 as keratolytic 118, when basal metabolic rate is low (dose dependent on age)

Keratosis Pilaris

Keratosis pilaris is a follicular disease of the pilosebaceous orifices characterized by the appearance of minute horny plugs and papules which give the skin a stippled appearance. The exact cause is unknown It may possibly be a milder form of ichthyosis follicularis (p 385) No age is exempt although the condition is most common during adolescence It is commonly seen in persons with a dry skin and is definitely more common in winter than in summer Some investigators believe it is due to avitaminosis A particularly those cases associated with ichthyosis. Hypothyroidism also has been cited as a possible cause.

Clinical Picture—The lesions appear as dry pinhead size, raised follicular papules, which together resemble the surface of a nutmeg grater (Fig 158) and when palpated feel like goose flesh Some of the papules when examined closely will be seen to be pierced by a hair More often, however the lanugo hair appears curled up within the follicle. Lesions usually assume the color of normal skin but they may be reddish or violaceous (keratosis pilaris rubra) As the condition progresses, the papules become flatter and finally result in punctiform cicatrices. Those on the scalp may account for permanent alopecia. The individual papules are discrete, at times showing a tendency toward grouping, and the skin between them appears dry and somewhat scaly or else normal The areas of predilection are the exterior surfaces of the arms, forearms elbows, thighs, legs, knees and abdomen Any region of the body may be involved except perhaps the fatty and moist areas which are spared Moderate or slight itching may be present When occurring on the eyebrows the condition is known as ulerythema ophrygenes.

Diagnosis.—The lesions, raised papules which are found at the outlets of the pilosebaceous glands resemble goose flesh and when palpated feel like the surface of a nutmeg grater Broken off hairs appear as black dots. When the papule is removed it leaves a slight depression which soon disappears.

Differential Diagnosis.—The fact that in keratosis pilaris the lesions (papules) are limited to the pilosebaceous orifices is helpful in differentiating it from ichthyosis. The fact that heat has no effect on the lesions of keratosis pilaris will simplify differentiation from goose flesh. The fact that it is unassociated with any marked inflammatory reaction of the skin and that it is localized to the orifices of the sebaceous glands is in contrast to papular eczema The distribution of lesions differentiates it from pityriasis rubra pilaris The papular syphilid

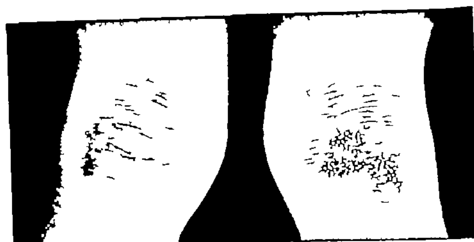


Fig. 158.—Keratosis pilaris in child 6½ years of age. (From the Flower and Fifth Avenue Hospitals, Department of Dermatology New York.)

can be ruled out by the longer duration and the localized distribution of keratosis pilaris as well as by the history and the appropriate laboratory tests. The insidious onset and more localized distribution are in contrast to *lichen spinulosus* in which the eruption is of an explosive nature, occurring suddenly and is more or less generalized, appearing in crops. There should be little difficulty in ruling out *lichen scrofulosorum*, in which, in contrast to keratosis pilaris, the papules are neither keratotic nor rough but flat, pinhead in size, pinkish or reddish, often covered by a shiny scale and desquamating, and occur in tuberculous children.

Complications and Prognosis.—Cicatrices, marking the aftermath of the disease, are responsible for permanent alopecia. Miniature pustules due to staphylococcic infection of the coiled hair in the papule sometimes occur. The condition is chronic, but good insofar as recovery is concerned.

Prophylaxis and Treatment.—A moderate sized dosage of vitamin A (25,000-50,000 units) should be prescribed to patients showing any tendency to avitaminosis A. Sulfonated soaps or superfatted soaps should be used instead of the ordinary alkali soaps. Such patients tolerate soap and water poorly.

Some patients respond satisfactorily to small doses of desiccated thyroid gland, which deserves a trial. The dose varies with the age and weight of the child, ⅛ gr (8 mg.) for infants to ¼ gr (16 mg.) for younger children. Older children can take 1 gr (65 mg.) of desiccated thyroid gland once daily. Keratolytics such as sulfur and salicylic acid should be prescribed, alone or in combination. The tars are often beneficial. Fractional roentgen ray therapy is of some value in stubborn cases but it is only of temporary value.

Representative Prescriptions

℞
Naftalan (5%) 1.5
Salicylic acid (2%) 0.6
Zinc oxide ointment q.s. ad 30.0
Misce et fiat unguentum
Signa: Apply several times daily
Indication: Keratolytic—reducing agent
(Andrews)

℞
Glycerin
Camphor water
Rose water aa q.s. 180.0
Misce et fiat lotio
Signa: Apply
Indication: Antiphlogistic
(Sutton)

See Formulary ℞ 35, 88, as keratolytics; 118, for associated hypothyroidism or low basal metabolic rate; 121, for vitamin A deficiency.

Keratosis Follicularis

(Darier's Disease)

Keratosis follicularis is a comparatively rare disease of congenital origin characterized by the

as to render clinical diagnosis impossible Particular difficulties of diagnosis are encountered in those cases of ichthyosis vulgaris in which the erythrodermic changes appear secondary to trauma and local irritation but interrogation of the parents will reveal the erythroderma to be of recent origin and to have followed secondary irritation

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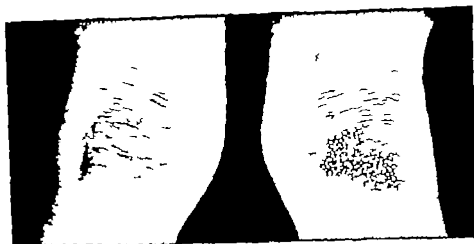


Fig. 158.—Keratosis pilaris in a child 6½ years of age (From the Flower and Fifth Avenue Hospitals, Department of Dermatology New York)

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Salicylic acid (2%)	0.6
Zinc oxide ointment q.s. ad	30.0

Misce et fiat unguentum
Signa. Apply several times daily
Indication. Keratolytic—reducing agent

(Andrews)

℞
Glycerin	
Camphor water	
Rose water aa q	180.0

Misce et fiat lotio
Signa. Apply
Indication. Antiphlogistic

(Sutton)

See *Formulary* ℞ 35 88 as keratolytics; 118, for associated hypothyroidism or low basal metabolic rate; 121 for vitamin A deficiency.

Keratosis Follicularis

(Darier's Disease)

Keratosis follicularis is a comparatively rare disease of congenital origin characterized by the

appearance of dark, dirty looking, warty papular excrescences appearing symmetrically upon the face the trunk and the flexures of the extremities.

According to Peck and his co-authors, the disease is one of vitamin A deficiency due either to an hereditary or an acquired weakness in the absorption of vitamin A or in the conversion of provitamin A into vitamin A which is

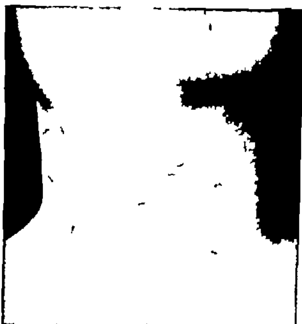


Fig 159 —Keratosis follicularis (Darier's disease) Note the hard, grouped, horny papules on the neck. Biopsy confirmed the diagnosis. This patient also had milium (see Fig. 191)

reflected in the skin as a dyskeratosis It is said to be congenital because it frequently begins in childhood. Several instances may be observed among members of the same family and it has been known to appear in as many as three or four generations. The disease is more common in boys than in girls.

Clinical Picture —The primary lesion is a small pinhead papule covered with a dry horny mass (a thorn crust) i e a combination of crust and hyperkeratosis (Fig. 159) The color varies from a dirty yellow to perhaps a grayish brown or it may be reddish Upon removal of the crust a characteristic funnel-shaped horn resembling an upholsterer's nail or carpet tack is discovered which fits in and fills a gap in the skin An interesting feature is the grouped distribution of the lesions. The plaques are greasy definitely elevated and distributed symmetrically over the trunk extremities, face and neck. In certain regions, such as the folds of the skin, nasolabial folds axilla groins, perianal area and around the mouth, the small tumor like lesions tend to become macerated. Secondary invasion with pyogenic organisms may lead to infection suppuration and ulceration. This condition is often responsible for an offensive odor On other regions, some of the lesions may show a nevi like arrangement (systematized nevi)

The scalp in contrast to other areas of the skin shows an entirely different clinical picture. Here, the lesions are crusted like a seborrheic dermatitis and, when the crusts are removed, the carpet tack-like formation found on the glabrous skin is absent. Instead the lesions are verrucous and moist but unaccompanied by hair loss

The clinical picture seen on the dorsum of the hands and the palms is also quite distinctive so that a diagnosis may be reached from their appearance alone. These lesions consist of small, flat, slightly elevated papules bearing a close resemblance to verruca planae juvenilis, for which the lesions are often mistaken. The skin of the palms and soles is thickened and hyperkeratotic, resembling keratoma palmaris et plantaris. The nails are often normal but in other instances are thickened, of a dull appearance striated, crumbly and associated with a subungual hyperkeratosis. The mucous membrane of the mouth is rarely involved, but occasionally discrete grouped lesions or a single nodule may be found upon a hyperemic base.

The conjunctival and vaginal mucosa are sometimes involved The tongue may show villous papillae. The disease is not infrequently first discovered behind both ears.

The general health is seldom affected However some patients complain of itching and a burning sensation of the skin.

Darier's disease may appear *in formè fruste* in which because the clinical signs are poorly developed diagnosis is rendered difficult. Recently considerable interest has been aroused in the so-called Hailey Hailey's disease. This is a bullous disease which as some dermatologists believe is a bullous form of Darier's disease—a peculiar erythematous bullous and crusted

dermatosis, i.e. keratosis follicularis with vesiculation or the so-called "familial benign chronic pemphigus.

Diagnosis.—Diagnosis is comparatively simple when the clinical picture is fullblown. When keratosis follicularis is suspected, the scalp face retro-auricular region, axilla, interscapular area and genital regions should be examined, for it is upon those areas that the characteristic lesions are know first to appear. The primary lesion is a papule, verrucous-like, which often yields clue. When the crusts are removed, the carpet-tack-like plug definitely establishes the diagnosis. This fact also rules out diagnosis of acanthosis nigricans, some forms of ichthyosis, Brookes keratosis follicularis, acrokeratosis verruciformis and molluscum contagiosum.

Prophylaxis and Treatment.—Since approximately 50 per cent of the offspring of the diseased patients will in turn be affected and transmit the disease in a similar ratio to their children, Hitch *et al.* have gone so far as to urge that the intelligent patient with keratosis follicularis avoid having children.

There is no specific remedy. However there are patients who respond to high doses of vitamin A (100,000-200,000 units) taken daily. Even so the vitamin, given by mouth, must be continued for many weeks or months before noticeable improvement occurs. Topical treatment consists in the use of keratolytic ointments and frequent bathing with soft soap. Roentgen therapy is of temporary value only since the lesions recur when it is discontinued. Accordingly roentgen therapy is not advised for children.

See Formulary R 35 keratolytic 120 when due to vitamin A deficiency

Keratosis Palmaris et Plantaris

This disease is congenital symmetrical thickening of the horny layer of the epidermis of the palms and soles.

There are three types. The first type is limited exclusively to the palms and soles and manifests itself shortly after birth, it is this form which will be described under "Clinical Picture." In the second type, keratotic changes appear in the form of striae and islands. In addition there are associated changes in the nails and slight ichthyotic changes on the extensor surfaces of the extremities with leukoplakia-like foci in the mucosa of the mouth. This type is accompanied by other anomalies, such as pachyonychia congenita, tylomas and leukokeratosis linguae etc. The third type, keratoma hereditarium dissipatum palmare et plantare is also described as keratoderma punctatum. It is represented by small, individual foci and is not limited to the palmar and plantar surfaces but is also localized on the volar surfaces of the fingers.

It occurs in several generations, indeed the hereditary nature of the condition manifests itself as a dominant mendelian character. However the tendency to inherit keratoderma varies. It may appear in a family previously free of the abnormality and, after being transmitted through several generations, as suddenly disappear.

Clinical Picture.—The lesions appear at birth or shortly after. The entire skin surface of the palms and soles, uniformly thickened and hard, ends abruptly at the lateral aspects, where it is sharply demarcated from the normal skin. The condition is sometimes associated with nevi. Soon after birth it manifests itself as a bluish line on the palmar surfaces of the feet which, as has already been remarked, are sharply demarcated from the dorsal surfaces. Then slowly after several months, thickening (keratoma) becomes more noticeable, the plantar surfaces become transformed by a progressive reddening, then yellow discoloration and finally a thickening throughout the entire plantar surface or part of it (Fig. 160). Often, there is an associated hyperhidrosis of the feet. In the fully developed picture the thickness may extend to the sides of the fingers and toes. Desquamation frequently follows. Closer inspection of the underlying surface discloses an erythematous area upon which are seen a number of linear striations or the horny masses may be separated by irregular oblique and transverse fissures. As a variant, the skin over the wrist, joints, elbows and knees may be involved. Occasionally small thickened plaques of epithelium may be noticed over the forearms.

Mal de Meleda (keratoma palmare et plan-

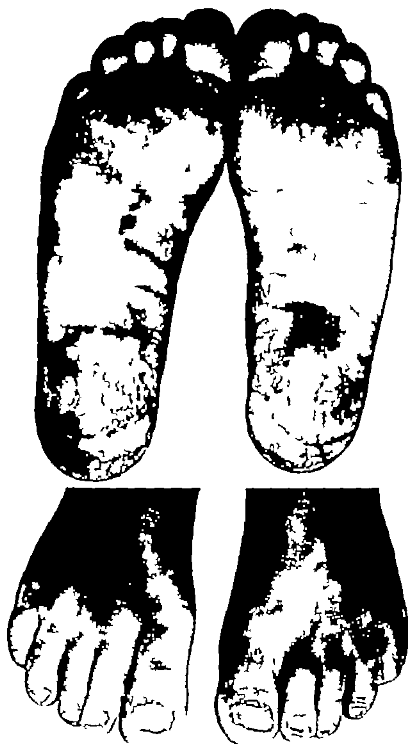


Fig. 160.—Keratosis plantaris, present since birth in a boy 10 years of age. Note the symmetrical thickening of the horny layer of the skin, the fissures and the thickened, opaque and dystrophic nails.

tara hereditarium) is a variant of keratoderma palmaris et plantaris. It derives its name from the Adriatic island of Meleda, where it was originally observed. Consanguinity is said to play an important part in the etiology. The disease in its typical form appears within the first two years of life, usually about the sixth month. Other areas of the skin are usually involved. Circumscribed areas of hyperkeratosis are seen on the internal malleoli, on the extensor surfaces of the knees and elbows, on the axillae, the dorsa of the hands and occasionally on the trunk. Abnormalities of the nails are frequently observed. Symptoms are those due largely to mechanical interference with the flexibility and sensibility to touch of the members involved and to the patient's personal reactions to his deformity.

Diagnosis.—Diagnosis is relatively easy because there is no other condition which can be mistaken for this disease. The cardinal points in diagnosis are the localization of the lesions on the palms and soles, their symmetrical distribution, which is found at birth or soon after, the hereditary history and the freedom from marked inflammatory reaction. (Only slight redness is observed.) The condition is chronic and rebellious to therapy and usually persists throughout life.

Treatment.—Pilocarpine and various endocrine preparations have been given alone and in different combinations, but with only temporary improvement. Keratolytics, such as 5-20 per cent salicylic acid, usually prescribed in the form of an ointment, have yielded temporary results in softening the thickened skin, but the condition recurs when local medication is discontinued. Roentgen ray therapy has also been of temporary value; it should, of course, be administered by a *skilled* dermatologist. In one case reported by Niles and Klumpp, great improvement followed and lasted more than two years. Properly padded shoes to relieve the mechanical irritation are helpful.

See Formulary ℞ 35 keratolytic.

Lichen Spinulosus

Lichen spinulosus is an inflammatory disease of the hair follicles in which a spiny epidermic peg occupies the center of the papule. The condition is usually seen in children and is apparently more common in boys than in girls. The cause is unknown. Some investigators feel that the condition is a variant of lichen planus without the itching common to the latter. The disease has also been attributed to vitamin A deficiency but this theory has never been proved.



Fig. 161.—Lichen spinulosus in child 4 years of age. (Courtesy of Dr. Adrian Neumann.)

The lesions (Fig. 161) appear as horny follicular papules, symmetrically distributed over wide areas of the trunk and extremities. The lesions may appear also on the neck, abdomen, buttocks and thighs. In some instances a fine, filiform spine or spicule may be seen protruding from the center of the papule; in other instances the projecting spine emerges directly from the follicle and there is no papular lesion. The lesions may appear in crops, assuming the form of localized patches which feel to the examining fingers like the surface of a nutmeg grater. When the papules are erythematous their color soon fades into that of the normal

skin Usually there are no subjective symptoms and little or no itching.

The condition can be differentiated from *lichen scrofulosorum* by means of the tuberculin test from follicular *syphilid* by the proper laboratory tests from *pityriasis rubra pilaris* by the distribution and character of the lesions and from *keratosis pilaris* by the sudden development of the lesions in contrast to the slow development in the latter as well as by the clinical picture.

The condition is extremely chronic and may persist through life. When evidence points to a vitamin A deficiency an attempt should be made to supplement the ordinary vitamin A supply by prescription either of capsules or of a suitable standard preparation in doses of 25 000 to 50 000 units or more daily This routine should be followed for at least three weeks or longer After a rest period of a week treatment should be resumed.

Topical therapy calls for keratolytics. Three to 5 per cent salicylic acid combined with 1 to 2 per cent resorcin may be prescribed either in ointment or as a lotion

See Formulary ℞ 29 35 keratolytics.

Hereditary Ectodermal Dysplasia

(Congenital Ectodermal Defect)

The term "ectodermal defect has been limited to those conditions arising from incomplete development of the epidermis or its appendages, or its absence in circumscribed areas, thus excluding the keratodermas and the nevi.

There are two main types of hereditary ectodermal dysplasia The so-called "anhidrotic type is associated with a complete absence of the sweat glands and sweat ducts and sometimes with a complete absence of sebaceous glands and ducts In a second category are grouped various modifications of the first type not infrequently found associated with a partial absence of the sweat glands and ducts or of the sebaceous glands and its ducts and called for convenience the hidrotic type Variants of both types are sometimes encountered and have been reported in the literature. These are spoken of as variants of the major type of hereditary ectodermal dysplasia.

According to the present concept, hereditary ectodermal dysplasia of the anhidrotic type is due to a gene mutation in the X chromosome, which is sex-linked but not completely recessive. This syndrome is rarely seen in females.

Clinical Picture and Diagnosis.—It is perhaps well to think of the symptomatology as belonging to one of these two types, anhidrotic or hidrotic, and to discuss the signs and symptoms from the viewpoint of the different structures involved Between the two major types of dysplasia there are many variants.

INTOLERANCE TO HEAT AND FAILURE TO PERSPIRE.—The inability of the subject of the major type of hereditary ectodermal dysplasia to tolerate heat, especially on hot days, has been mentioned by all investigators of the true anhidrotic type. The total absence of sudoriferous glands is one of the most distinguishing and interesting features of this group of ectodermal defects. Ordinarily these patients feel fairly comfortable on cool days and seemingly achieve the ordinary tasks of life without undue exertion. However on a hot humid day they evidence elevation of temperature headache, vertigo and fatigue.

A failure to perspire even slightly on hot days almost always is the symptom that first attracts the attention of the parents. Not only are the sweat glands involved but the sebaceous glands, which, like the sweat glands, are of ectodermal origin also are frequently affected. Accordingly the hair of the scalp when plentiful may be dull and dry owing to the scantiness or absence of sebaceous secretion

OTHER SIGNS AND SYMPTOMS.—*Hair* is absent or there may be a failure of hair growth and only lanugo hairs as seen in early infancy may be present. In other cases there is an almost complete hypotrichosis. A congenital alopecia may occur In still other instances hair on the scalp and body is sparse and of fine texture. Eyebrows and eyelashes may be absent (Fig 162)

The *facial appearance* caused by the nasal deformity and protruding supra-orbital ridges is quite characteristic The forehead is high and wide the supra-orbital ridges are invariably prominent The bridge of the nose is depressed,

causing a resemblance to a syphilitic nose. The chin is ery small and pointed. The whole effect is of face squashed from above downward, ith the upper half much longer than the lower



Fig. 162.—Congenital ectodermal dysplasia in an infant. The almost complete baldness, the absence of eyebrows and deficiency of eyelashes are striking. (By permission from James, Theodore Acta Paediatrica 41 229-.37 May 1952.)

The angle of the jaw is obtuse The palpebral fissures are narrow

The *lips* are uniformly described as thick, everted and protruding. There is lessened definition of the vermilion border Pseudorhagades, or fine linear wrinkles radiating from the nasolabial folds or near the eyelids, have been noted; the lips pout on closure of the mouth, giving the patient an aged appearance.

Abnormal *dentition* is present in every case in fact it and anhidrosis and hypotrichosis constitute the three basic signs of this condition. Cone-shaped incisors are common (Fig. 163 *A*) The teeth are few in number and prone to early decay They may be malarranged. The deciduous teeth may be kept for abnormal periods. Roentgen examination of the mandible will determine whether there are any teeth of the permanent set. There may be partial or complete anodontia (Fig. 163 *B*) or one or more teeth may be found by roentgenologic examination. The abnormalities extend to both deciduous and permanent dentition. Often the upper central incisors are the only teeth present and are peg-shaped and unduly spaced.

Strangely enough the *tongue* a structure derived from the mesoderm, is affected in this condition and may be elongated. The sense of taste may be absent. The *mucous membranes* may show atrophic changes causing atrophic rhinitis and dysphasia.

Sweat may be absent or present, as has already been said. Impairment of *lacrimal glands* frequently results in failure of lacrimation. Frequently there is a disturbance of the sense of *smell* and disturbance of the sense of *taste* *Hoarseness* has been reported, apparently due to the dry atrophic mucous membranes of the

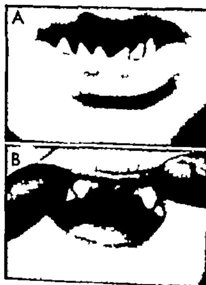


Fig. 163 —Congenital ectodermal dysplasia in girl 4½ years of age. A shows the typical dental dysplasia in the form of conical (shark ") teeth of the first dentition. The eyebrows were absent. B shows the conical lateral incisors and the absence f upper central incisors. (By permission from James, Theodore Acta Paediatrica 41.229-237 May 1952.)

voice box. Anomalies of *ears* have been described with different configuration on either side Some are pointed on the top satyr ears have been reported Dysplasia of the *nails* is *frequent with abnormalities of shape and color* The central body of the nail may be spoon-shaped concave and depressed The nails of fingers and toes may be rudimentary brittle and dry There is a tendency for the nails to tear from their beds leaving a raw surface and a scar On the other hand the nails may be normal

There are a few reports of anomalies of the *nervous system* which is of ectodermal origin. Mental deficiency has been reported.

The signs and symptoms outlined above establish the diagnosis.

Prognosis.—Hereditary ectodermal dysplasia *is not incompatible with longevity Patients* while uncomfortable during hot weather often lead active lives although work requiring strenuous effort is, of course not for them. They must learn to live with their condition although there are some *alleviations available*

Patients with ectodermal defects have reached adult life, married and procreated Intelligence as in any group has varied. The lack of hair is only a problem of esthetics which can be corrected by artificial means. Artificial dentures can be supplied the lack of teeth is therefore no serious handicap in regard to securing adequate nourishment. However the absence of sweat and sebaceous glands does mean the discomfort of the patient.

Management—No single remedy or group of remedies—endocrine, vitamin or other therapeutic agents—has answered to cure hereditary ectodermal dysplasia. This failure is understandable because the defects are developmental, produced by the arrest of certain ectodermal and mesodermal structures during fetal life Accordingly the dermatologist's mission is merely to render the patient more comfortable by various mechanical means, physical devices and topical remedies

Epidermolysis Bullosa

(Epidermolysis Hereditaria)

Epidermolysis bullosa is an uncommon disease of the skin characterized by vesicles and *bullae which, appearing at birth* or soon thereafter generally follow trauma. There are two main varieties, simple (or benign) and dystrophic.

Although the exact cause is unknown it is *generally believed to* be an hereditary defi-

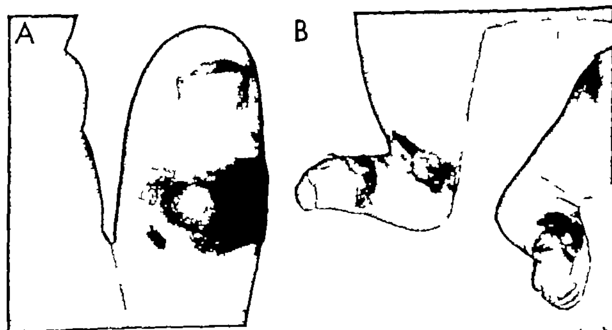


Fig 164.—Epidermolysis bullosa, simple type A, in a baby girl. Note the large bullae on the thumb. B in a 3-month-old infant (*A* courtesy of Dr John C Belisario. Photography by Mr Woodward Smith Department of Artistry University of Sydney)

ciency in the elastic fibers of the skin which makes for an increased susceptibility of the skin to a trauma resulting in vesicles and bullae. A definite familial tendency has been found. However in the simplex types cases have been reported both with and without the family history of the disease. It is inherited in the simple form as a dominant and in the dystrophic form as dominant or recessive characteristic.

In the simple form the disease is usually congenital. The lesions may be present at birth or may appear a few days or even two or three years after birth. The disease seldom occurs after the first two years of life except in the acquired type; in this form it may be seen during the latter years of life. Both sexes are approximately equally affected. Darier has shown that in both types exposure to the sun's rays may be of etiologic importance in producing lesions with an associated porphyrinuria, this factor probably accounts for the more common occurrence of bullae during the summer.

Clinical Picture.—SIMPLE TYPE.—The essential lesions consist of vesicles and bullae (Fig. 164) which usually appear over the bony prominences, the fingers, hands, wrists, ankles, knees and feet. They are produced by trauma or the pressure of a tight fitting garment. In infants the lesions are often noted when the infant begins to walk. Sometimes they are limited to the feet or to the hands, feet and buttocks, other cases show a more generalized distribution. The bullae involute after two to ten days and heal completely without leaving scars. The mucous membranes of the mouth are seldom involved in this type and the nails are not affected. The general health of the patient remains good.

DYSTROPHIC TYPE.—Not unlike the simple type, the dystrophic type also is characterized by the appearance of vesicles and bullae. Their distribution is likewise found over the extensor surfaces of the joints, elbows, knees, fingers, hands and feet (Fig. 165). This type differs, however, from the simple form in that the bullae are followed by considerable scar formation and pigmentation. In this type, too, the bullae are more apt to be hemorrhagic. Crusts are not uncommonly found after the vesicles and bullae rupture and at times deep ulceration may be seen. The skin may be xerodermatic, thickened and crusted, particularly over the elbows and knees.

A "lethal form" of the dystrophic type also has been recognized. The chief difference between this third form and the classic and simple dystrophic forms is that it is always followed by an early death, which usually occurs before the third month and never later than 8½ months. The lesions are typical of the dystrophic form with involvement of the mucous membranes of the mouth, pharynx, tongue and nails. In the lethal type, in contrast to the simple, the mucous membranes frequently share in the process. Atrophy of the skin at the sites of the lesions not infrequently occurs. Milia are sometimes found, particularly on the rims of the ears and on the dorsa of the hands. Nikolsky's sign (a separation of the epidermis from the corium) may be obtained. It is elicited by gently stroking the surface of the skin with the end of a tongue depressor or other blunt object. The skin may show several or many denuded areas, which are associated with crusts. Many variants occur between the simple and the dystrophic types.

Diagnosis.—The diagnosis is made from the finding of bullae that follow mechanical irritation from friction or from a tight-fitting band or garment. They usually appear on the bony prominences. Nikolsky's sign is usually present. Although a positive hereditary and familial history is often elicited, it is not absolutely essential for diagnosis.

Differential Diagnosis.—In children, *pemphigus vulgaris* should be considered in differential diagnosis even though it is extremely rare. The facts that in this disease the bullae appear spontaneously, seldom at birth or soon after and mostly on the trunk are all in contradistinction to epidermolysis bullosa. In newborn infants the history and blood serologic tests will clear any doubts as to whether the lesions are due to *congenital syphilis*. In epidermolysis bullosa there are not likely to be similar lesions among other infants in the nursery, as there probably would be if it were bullous *impetigo contagiosa*, in which, again in contrast, there are no lesions on the mucous membranes of the mouth and there is usually prompt response to antibacterial and antibiotic therapy. If congenital *vari-*



Fig 165.—Epidermolysis bullosa, dystrophic type A and B in a young girl Note the destructive lesions (ruptured bullae) and loss of the toes. C, of seven years duration in a child 9 years of age (*A* and *B* courtesy of Dr John C. Belisario. Photography by Mr Woodward Smith, Department of Artistry University of Sydney *C* courtesy of Dr Meyer L. Niedelman.)

cella and congenital *variola* must be ruled out, it should be remembered that they occur only rarely and, in every case reported, the mother was afflicted with the same disease at the time of the infant's birth.

Complications.—Atrophy of the skin at the site of the lesions, scarring loss of nails and hair and epidermal cysts have been reported In extensive and severe involvement, the fingers may show conical tapering and there may be clawlike deformities of the hands. Dwarfism also has been reported

Treatment.—There is no specific therapy The bullae should be opened under sterile conditions. A mildly protective ointment such as Lassar's zinc paste or zinc oxide ointment should then be applied as a topical dressing. Antibiotics should be administered either by mouth or by intramuscular injection when secondary infection occurs. In the lethal and dystrophic types cortisone should be given a fair trial.

Pachyonychia Congenita

Most cases of congenital pachyonychia are seen in children In addition to the great thickening of the nails (Fig. 166) other lesions are

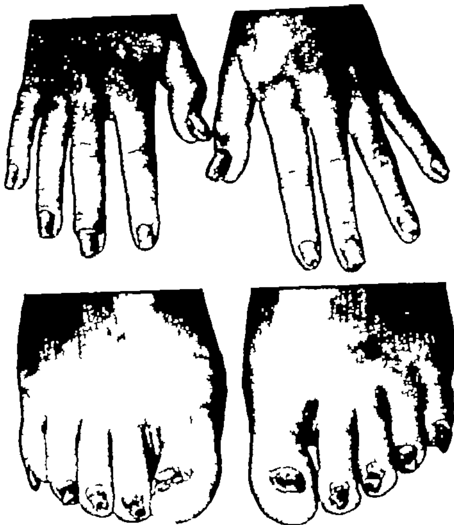


Fig. 166.—Pachyonychia congenita in girl 10 years of age. The nails are greatly thickened and piled up beneath with hyperkeratotic material.

sometimes seen, including bullae, palmar and plantar keratosis, leukoplakia, anomalies of the hair an acneform type of follicular keratosis especially on knees and elbows and dyskeratoses of the cornea. General ichthyosis in varying degree may be absent or present. Abortive forms may occur and these include ichthyotic stripes of hyperkeratosis on the flexures of knees and elbows and also on the anterior surface of the axillae and the umbilicus. There is no specific therapy The aim in treatment is to make the patient as comfortable as possible.

Incontinentia Pigmenti

(Bloch-Sulzberger Syndrome)

This peculiar skin disease, probably developmental in origin, is characterized by an extremely striking and bizarre arrangement of pigmented macules in polyangular flecks, whorls, spidery forms, lines and patches. These chocolate-brown designs do not follow lines of cleavage or nerve distribution nor do they respect the limitations of the mid-line.

The exact cause is unknown although it has

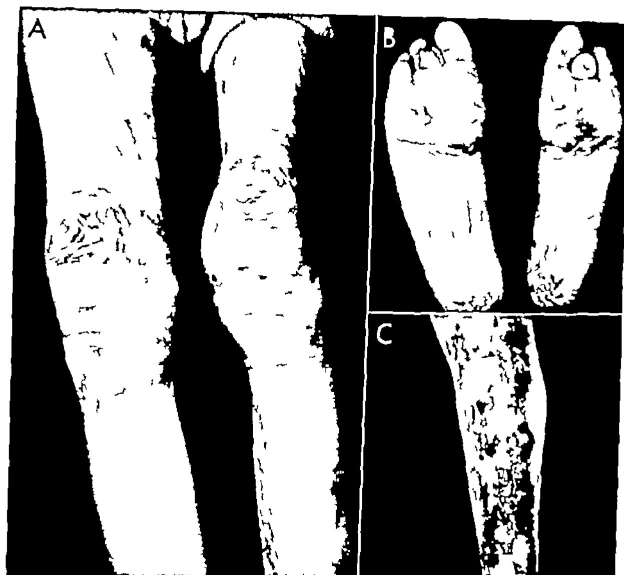


Fig 165.—Epidermolysis bullosa, dystrophic type. A and B in a young girl Note the destructive lesions (ruptured bullae) and loss of the toes. C of seven years duration in a child 9 years of age (*A* and *B* courtesy of Dr John C. Belisario Photography by Mr Woodward Smith, Department of Artistry University of Sydney *C* courtesy of Dr Meyer L. Niedelman.)

cella and congenital *variola* must be ruled out it should be remembered that they occur only rarely and, in every case reported the mother was afflicted with the same disease at the time of the infant's birth.

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Pachyonychia Congenita

Most cases of congenital pachyonychia are seen in children. In addition to the great thickening of the nails (Fig 166) other lesions are

preventive measures. Infant and child subjects of incontinentia pigmenti should be examined with thoroughness in order to detect other possible defects and anomalies, which should be corrected whenever possible.

There are no specific remedies. Therapy consists in the use of protective ointments and creams (e.g. Lassar's simple zinc oxide paste) whenever indicated.

Cutis Hyperelastica

(Ehlers-Danlos Syndrome, India Rubber Skin)

This is a congenital anomaly characterized by hyperelasticity and fragility of the skin. The cause is unknown, but the condition is hereditary having been reported in several generations. It begins in early childhood. The criteria must present the following conditions to fulfill the complete syndrome (1) friability of the skin and blood vessels (dermatorrhexis) (2) overextensibility i.e., overelasticity of the joints (arthrocholasis) (3) overelasticity of the skin (dermatocholasis) and (4) pseudotumors and subcutaneous nodules.

Friability of the skin and blood vessels.—Slight trauma of the skin may produce

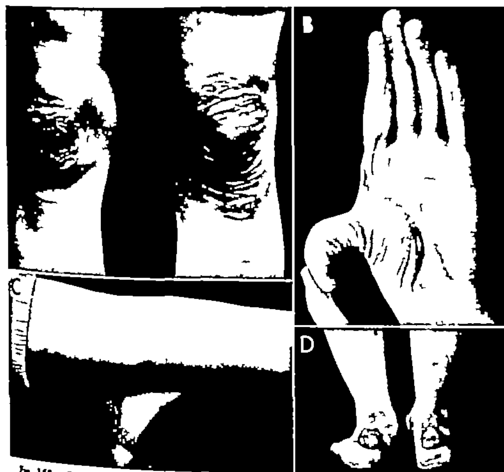


Fig. 148.—Cutis hyperelastica. In A there are papyraceous scars over the knees. B shows hyperextension of the thumb joint and C the great elasticity of the skin of the forearm. In D there are pigmented, raisin-like pseudotumors of loose connective tissue over the backs of the heels. (*A B* and *C* by permission from Bohan, R. M.: Brit. J Dermat. 50 174 1938 *D* by permission from Smith, Carl H. J. Pediat. 14:632-641 May 1939.)

been suggested that the condition may be caused by an infection of the mother during pregnancy by some unknown virus The hereditary nature of the disease is not well established. Familial and hereditary transmissions have been reported Inheritance of other developmental anomalies in association with it have been reported, the disorder tending to occur in families with defective plasm However the associated developmental defects in patients with incontinentia pigmenti and their families vary widely Females are more frequently affected than males

Incontinentia pigmenti usually begins early soon after birth but it may appear at any time



Fig 167.—Incontinenti pigmenti in a feeble minded patient, tetraplegic and with nystagmus. Pigment has remained unchanged. (Courtesy of Dr Thomas Butterworth)

up to the end of the second year The clinical hyperpigmentation which is brought out clearly by histopathologic study is due to chromatophores which are heavily laden with melanin located within the upper and middle cutis. Bloch and Sulzberger were of the opinion that the pigment dropped down into the cutis instead of being carried upward and disposed of in the epidermis, the passive descent of the pigment led to an autochthonous tattooing with melanin which remained for many years.

Clinical Picture—Two phases are generally conceived to be present, a bullous phase and a pigmentary stage The bullous phase according to Carney and others, is so characteristic that a prediction of incontinentia pigmenti can be made from it. Inflammatory lesions, particularly in the form of vesicles and bullae, appear in lines or patches and precede the pigmentary stage. There may be several episodes of bullae which appear and disappear and then recur over a period of weeks or many months. Finally this stage is followed by the well known pigmentary stage which is recognized as the clinical picture of the disorder However the first stage of bullous lesions may be followed by an intermediary stage of linear verrucous lesions, which gradually disappear and leave behind the pigmented macules of incontinentia pigmenti

The macular pigmented eruption may appear as bands or as symmetrically arranged striae or again as irregular lines, flecks and whorls consisting of stellate patches of a chocolate-to-medium brown pigment. These, occurring on the trunk, arms and legs, frequently present a bizarre configuration (Fig. 167) Wavy parallel bands of hyperpigmentation may be distributed on the sides of the trunk and on the thighs producing a typical "zebra pattern. Or the pigmentation may be distributed in a "bathing suit" configuration.

Complications and Prognosis.—Areas of alopecia in the scalp have been noted rather commonly Ectodermal and mesodermal defects have been reported as have also developmental defects referable to the ocular central nervous and osseous systems. Defects of the teeth nails and hair and glioma of the eye have been noted. Microcephaly has been reported Delayed or imperfect dentition is frequently seen. Other developmental anomalies and defects include supernumerary ears absence of retinal pigment and congenital heart disease These defects are not infrequently seen in siblings or in parents.

The pigmentary skin manifestations gradually fade out and disappear sometimes over many years.

Diagnosis.—The diagnosis of incontinentia pigmenti is made by the appearance of a bullous eruption on the body at birth or soon after Bizarre-shaped pigmentary lesions, sometimes atrophic, of a slate or brownish color form a characteristic unmistakable pattern one not seen in any other dermatitis. This clinical picture may be accompanied by ectodermal and mesodermal defects. The condition may be familial.

Treatment—As far as is known there are no

Annular Constrictions of the Digits
(Pseudo-Ainhum)

Congenital annular bands (Fig. 169) may be noticed in the early neonatal period varying in severity from simple, easily correctible grooves to the complete amputation of a digit or limb below the constriction. Among the different theories advanced as to etiology the most plausible is that of Streeter who concludes that local necrosis of the limb bud tissue occurring in the developmental embryonal stage is responsible.

It is unfortunate that the term "pseudo-ainhum" has been applied to conditions in infants and children characterized by annular bands constricting the fingers and toes. The word "ainhum" originates from an African term meaning "to saw" or "to cut." True ainhum is usually encountered as a tropical or semitropical disease of great chronicity usually occurring in the Negro and confined with rare exceptions to the male. It is characterized by spontaneous amputation of the toe, usually the fifth toe although in some cases the fourth, as the result of a constrictive band or a line of demarcation which gradually forms at the proximal interphalangeal joint and gradually deepens its furrows until there occurs a spontaneous amputation. It may be related to trauma, such as encircling lacerations, burns or frost-bite, which frequently heal with band-like scars. In true ainhum, usually considered limited to dark skinned persons of the tropics or near tropics, a painless, progressively constricting band distal to which the blood vessels are thickened and enlarged, although their caliber is narrowed by endarteritis, ends in a spontaneous amputation of the distal portion of the digit. Constricting bands due to other diseases, simulating ainhum or occurring concomitantly with it (e.g. leprosy scleroderma, diabetes, syringomyelia, pityriasis rubra pilaris, hyperkeratosis of palms and soles and trophoneurosis) may also produce ainhum.



Fig. 169.—Annular constriction of digit in a girl 9 years of age. (By permission from Bluefarb, Samuel M.: Arch. Dermat. & Syph. 57 741 1948.)

Cystic Hygroma of the Neck
(Hygroma Cysticum Colli)

Cystic hygroma is a soft, semifluctuant cystic tumor containing lymph and lined with endothelium. The etiology is obscure. True cystic hygromas occur about equally in male and female infants, perhaps predominating slightly in females. They are usually congenital but may

bruises. Gaping wounds as the result of falls may heal poorly and result in linear and irregular scars especially on the upper and lower extremities. The scar tissue has been described as thin and paperlike (papyraceous) like cigarette paper and atrophic (Fig. 168 *A*)

Not uncommonly in suturing wounds in such patients, one finds the sutures do not hold so that often it becomes necessary to approximate the edges with adhesive tape. *Not only is* the fragility of the skin an outstanding sign but these patients also experience great difficulties in healing, even from the smallest cuts and bruises Ecchymotic areas of different colors and sizes varying from a reddish to purplish hue *may be found usually over bony prominences* These which may be produced by only slight pressure on the skin are the result of hematomas and as pigmentary deposits last many months

OVEREXTENSIBILITY (HYPEREXTENSION OF JOINTS) —This is one of the constant and characteristic features of the disease. It may be limited entirely to the interphalangeal joints It may be general or both thumbs only may be hyperextended (Fig 168 *B*) Later there may *develop a weakness of the muscles and looseness* of the joints which becomes apparent in walking

OVERELASTICITY OF THE SKIN —The skin as a whole, smooth soft and velvety can be stretched to an abnormal degree (Fig. 168 *C*) On release, the stretched skin resumes its normal contour and position sometimes returning with an audible snap like that heard following the release of a rubber band that has been drawn out. The looseness of the skin is most *often found over the upper and lower extremities.*

PSEUDOTUMORS AND SUBCUTANEOUS NODULES —These are generally but not always present. The pseudotumors sometimes referred to as molluscoid, empty" raisin-like pseudotumors (Fig. 168 *D*) are formed gradually by evagination *of the loose folds of the skin with* subsequent hemorrhage in the recesses. Smith described *these pseudotumors* as "raisin-like swellings which occurred behind each heel of *his patient.* These subcutaneous nodules may be present anywhere but they occur particularly in areas subject to greatest trauma. They have a shotty feel vary in size (often being pea-sized) are painless and freely movable and can be made more prominent by stretching the skin. *They are due to small areas of fat necrosis in* the subcutaneous tissues. In addition there may be numerous blotches *of bluish and brownish* pigmentation the result of old bruises, and the skin may be disfigured by wide irregular and *atrophic scars that are the result of cuts.*

Diagnosis.—Diagnosis is made when the symptoms and signs meet the four diagnostic criteria described above. When they are met there is no difficulty in differential diagnosis and both *cutis laxa* and the dystrophic type of *epidermolysis bullosa* can be ruled out.

Complications.—The subcutaneous nodules *may undergo calcification. Disfiguring* atrophic scars remain as the result of cuts. The possibility of injury may not only interfere with the playing of games but may conduce to an inferiority complex.

Prognosis and Treatment.—The condition is lifelong but not incompatible with an active existence. The physician should attempt to prevent trauma to the skin and to provide general supportive measures, including a well balanced, high caloric diet with adequate vitamins and inorganic iron to combat anemia *if it is present.* There is no specific therapy

Cutis Laxa

Cutis laxa is characterized by *a laxness of* the skin, which being bigger than the surface it is intended to cover hangs in folds. As Roncheso has pointed out, it would be better termed "dermatomegaly It is universal over the body and imparts a prematurely senile appearance especially in young children *It increases in intensity* and degree with age. Clinical and pathologic examination *show the skin to be otherwise* normal

The condition is often confused with *cutis hyperelastica* In contrast to the latter however the skin in cutis laxa does not snap back like a rubber band when it is stretched and the other diagnostic criteria of cutis hyperelastica also are missing.

are painless. Some of the lesions appear to present a central depression simulating that of molluscum contagiosum. Others may be rounded or oval shaped but they are always quite firm. They continue to grow slowly until they reach the size of small peas (resembling split peas) and then remain consistently stationary throughout life. Telangiectatic blood vessels may be seen to course over some of the larger lesions.

Diagnosis is based upon the facts that the condition is familial, that it occurs in several



Fig. 170.—Multiple benign cystic epithelioma in a girl 16 years of age. The lesions were distributed symmetrically on both sides of the face and about the ears. (By permission from Sommerill, F and Hutton, J G Arch Dermat. & Syph. 26 855 1932.)

members of the family that the lesions appear early in life (either childhood or at puberty) have a characteristic distribution on the face and are chronic after attaining certain size. The lesions do not undergo ulceration.

The disease can be differentiated from *cylindroma* by the smaller size of the lesions and the fact that they do not usually occur on the scalp as they do in the latter disease. The firm consistency and the distribution of the lesions differentiates them from those of *adenoma sebaceum* in which they are soft and generally appear at the nasolabial folds and often on the scalp *Molluscum contagiosum* can be ruled out by the lack of a cheese-like excretion through the central opening and also by the lack of a contagious feature.

The course of the condition is slow but at times the lesions may grow rapidly Spontaneous involution is unusual the disease may be expected to persist unchanged throughout life.

Treatment consists of removal of the lesions for cosmetic effect. The methods employed for eradication are destructive they include excision, curettage and electrolysis. Excision should be done by electrocautery when the lesions are solitary or few because nearly all tumors removed by curettement or simple excision show recurrence at the margin of the scar For smaller lesions, carbon dioxide snow may be used with good effect. Extensive lesions are best treated with roentgen ray or radium. This procedure will be followed by small milia which can be removed locally

Adenoma Sebaceum

(Tuberous Sclerosis, Epiloia)

Adenoma sebaceum is a rare disease of congenital origin characterized by the appearance of tiny translucent, wax-like papules, usually located on the face, and telangiectasia, subungual fibromas and other congenital anomalies.

There are three types distinguished on the basis of histologic-pathologic differences. In Pringle s type (Pringle's nevus) there is an abundance of vascular and telangiectatic elements. Clinically the lesions appear as soft, erythematous tumors associated with greatly hypertrophied sebaceous glands and with many superficially dilated blood capillaries and telangiectases. In Balzer's type, less commonly seen, the distinguishing feature is the distribution in a butterfly pattern over the middle third of the face and nose of pale, discrete nodules. Vascular elements are absent. The Hallopeau-Laredde type is characterized by excessive fibrosis, the

In addition, Butterworth and Wilson have described plaques of seroid variety distributed on the upper part of the cheeks, on the forehead and in the templar region. Generally unilateral, its growth is slow with the lesions remaining stationary for years.

not be noticed at the time of birth appearing weeks or months later Most hygromas make their appearance during the first two years of life fewer after four years and very few after five years. A few hygromas have been reported in adult life.

The *clinical picture* is essentially that of a painless, slowly growing tumor The overlying skin is usually normal in appearance freely movable although it may be stretched and tense and of a bluish color Occasionally the growth is pedunculated but usually it is multilocular On the other hand the cyst may be monolocular The tumor itself is usually translucent in direct light Dyspnea from pressure on the trachea and dysphagia from pressure on the pharynx may be present, especially when the tumor is large.

Cystic hygromas usually appear in the anterior lateral area of the neck, most commonly *midway between the mandible and the clavicle* or below it In some cases they may extend into the face or axilla and posteriorly from the styloid process to the acromion. Less commonly the tumor may extend to the mediastinum. In rare instances hygromas have been found in the axilla and groin. The fluid content of the cyst varies with the size of the tumor

The *diagnosis* is not difficult. A history of a painless, soft semifluctuant tumor with the skin over the growth movable, but the growth itself not movable in the attached underlying tissues, appearing in an infant or child usually indicates hygroma. The tumor is usually translucent. Coughing and crying commonly increase the tenseness of the mass. Roentgenologic examination after the injection of a dye such as iodized poppy seed oil will indicate the extent of the cyst in the neck and mediastinum. Aspiration will reveal lymph or a blood-tinged fluid.

Cystic hygroma of the neck can be differentiated from *branchial cysts* by their larger size, the fact that they are apt to be multilocular rather than single and by the fact that branchial cysts, in contrast, are definitely circumscribed firm and tense and usually occur in the anterior triangle of the neck. A *solitary lymph cyst* can be ruled out because it does not occur in children. A *lipoma* grows less rapidly than a hygroma and aspiration does not yield fluid. *Thyroglossal cysts and fistulas* occur in the mid-line of the neck most commonly in the upper rather than the lower half which is a common site for hygroma. When pressure is applied to a *hemangioma* the vascular tumor is reduced in size but it refills when pressure is removed The lack of local inflammation and the discreteness, hardness and firmness of the lesion is in contrast to enlarged *tuberculous lymph nodes*

Treatment consists in the complete surgical removal whenever possible or else the use of radium or x-ray therapy Surgery should not be considered when the mediastinum is involved.

Multiple Benign Cystic Epithelioma
(Trichoepithelioma)

This congenital abnormality is characterized by small, round, multiple tumor growths elevating the skin and having a symmetrical distribution on the face neck and thorax. It occurs almost exclusively in females and appears in childhood or at puberty but generally between the tenth and fourteenth years. Its familial occurrence is well established. The lesions are usually distributed on the face, between the eyebrows, at the angles of the nose and the root of the nose, at the inner canthi of the eyes and the corners of the mouth. Here the lesions appear closely packed (i.e. grouped) in unsightly raised lumpy patches. The forehead and chin often share in this distribution of lesions. Less frequently affected are areas on the neck, thorax and upper parts of the upper extremities. In at least four of Goldman's cases the region in front of the ears was strikingly involved. At times the scalp and chest may harbor several lesions.

The individual lesions appear as tiny pearly yellowish or pinkish tumors, varying in size from pinhead to small pea and only slightly elevated above the skin At first the lesions are of normal skin color but as they grow they become shiny and translucent or perhaps take on a slightly yellowish or bluish tinge Many of them resemble white milia others resemble small vesicles (Fig 170) On palpation the lesions are found to be quite firm but not of a stony hardness They are freely movable in the skin when pressed between the fingers and they

stance may be expressed from the central depression.

Prognosis.—Few patients with adenoma sebaceum attain adult life. Intercurrent infection, epilepsy gastro-intestinal derangement, cardiac involvement or malignant growth of the internal organs may account for death, but epilepsy is the chief cause.

Some patients with skin lesions alone live apparently normal lives but occasionally mental symptoms develop in middle life. The skin lesions are benign but they are chronic and persistent and only seldom undergo spontaneous involution and then leave superficial scars.

Treatment.—Destructive measures such as electrolysis, fulguration, curettage, cauterization, excision and scarification have been employed. In some cases good results have followed the use of carbon dioxide snow. The barbiturates (phenobarbital) are the remedy of choice for the epileptic seizures.

Neurofibromatosis
(Von Recklinghausen's Disease)

Neurofibromatosis is generalized, congenital symptom complex affecting the skin, subcutaneous tissue, nervous system and frequently but not invariably associated with mental deficiency and skeletal changes. Of rather infrequent occurrence in children it is but poorly understood etiologically although an embryonal disturbance of specific elements of the nervous system may be the underlying causative factor. No real proof exists that the endocrine system is at fault. While some investigators have reported cases in male children with a paternal hereditary factor others have reported instances in which there was a maternal familial history. Males are affected as frequently as females. The condition may occur during early infancy childhood, puberty and even old age. As a rule, however it is first noticed between the ages of 2 and 6 years.

Clinical Picture.—The classical picture of neurofibromatosis of the adult type consisting of cutaneous pigmentation, nodular formation (neurofibromata) bone changes and mental and physical debility is seldom encountered in toto in children. In the child the signs and symptoms usually appear in a modified or aborted form. The clinical picture for childhood (Fig. 172) includes three cardinal signs pigmentation, nodule formation and skeletal changes.

1. Pigmentation.—The "café au lait spot is the most characteristic single sign. It frequently precedes the other signs and may be the only sign present. When it appears alone the disease is referred to as the incomplete form or forme fruste. Frequently because of the presence of pigmentation alone and the absence of the other classical signs, particularly of the nodular masses, the diagnosis may be missed. The pigmentation consists of patches the color of coffee with milk. The macular lesions, irregularly distributed over the lower half of the trunk, the upper and lower extremities and on the buttocks, vary from pinhead to cherry or even to plum size. There may be only a few spots or many they increase in size and number as the child grows older. The macules may be associated with freckles, nevi or angiomas. Sebaceous adenoma is frequently seen. In some instances the incomplete form is found associated with the characteristic bone changes.

2. Nodular formation (multiple soft tumors of the skin molluscum fibrosum and deeper neural tumors).—Neurofibroma, the most characteristic lesion of the disease, appears as pedunculated, sessile or flattened tumors (Fig. 172). From this sign alone a diagnosis of the disease may be made. Nodular formations are found more frequently among older children and adults; when present in children, as has been stated, they make diagnosis comparatively simple. However they are commonly absent especially during infancy and early childhood. Indeed they are generally preceded by the café au lait spots by many years.

The skin not only manifests a pathologic disturbance in the form of tumorous masses, but the nerves, bones and soft tissues may show changes. The cranial, spinal and sympathetic nerves may be involved; indeed an entire nervous plexus may be affected along with tumor formation. The tumors, few or many are usually soft, painless and various sizes. Most abundant on the trunk, head, neck and extremities, they are easily palpated on the skin and in the deeper structures of the skin. How

lesions consist of vascular and verrucous nodules of stonelike hardness due to an excessive proliferation of fibrous elements. All three types may exist in combination in the same patient and at the same time.

Etiology.—The exact cause is unknown. Tuberous sclerosis is probably as common in females as in males It has been reported among all races It is a rare disease of early life and may occur independently of adenoma sebaceum



Fig 171.—Adenoma sebaceum in a girl 10 years of age. Note the typical distribution. The child also had multiple fibromata on the body and a nevus anemicus. (Courtesy of Dr Meyer L. Niedelman.)

or be preceded by it by years. It is possible that the condition inherited is transmitted as an incomplete dominant trait.

Clinical Picture—Clinically the disease presents three characteristic features (1) adenoma sebaceum (2) mental deficiency and (3) convulsive seizures, the triad known as epiloia. The skin manifestations, which usually appear at the first as a few discrete pale pink and slightly elevated spots, symmetrically situated near the nasolabial fold. They progress slowly but show rapid increase in size at puberty or soon after When the lesions are fully developed they appear as a plaque of warty nodules (Fig. 171) of a pink red to reddish-yellow or brownish color Some of the lesions may even become pedunculated. They are found most abundantly not only at the nasolabial folds but also on the cheeks, where they assume a butterfly pattern over the nose and on the chin. Less frequently they appear on the upper lip and between the *nasolabial folds* but never below the clavicle. Several lesions may coalesce. The condition is unattended by pain or other subjective symptoms.

In about 50 per cent of patients there is a pronounced intellectual defect. The impaired mental state is frequently noted at birth or soon thereafter In many of these infants walking, talking and dentition are retarded Indeed many are either idiots or low-grade imbeciles.

The convulsive seizures appear early during infancy or early childhood and vary from a mild petit mal attack to very severe seizures and even status epilepticus.

"Formè fruste of tuberous sclerosis, showing no skin lesions, is not uncommon. Butterworth and Wilson speak of the shagreen patch which is highly characteristic of this type. Occurring as an uneven thickening of an area of the skin, it is elevated above the surrounding surface. Each plaque is irregularly shaped, of about a palm s breadth, usually single and commonest over the lumbosacral region.

Diagnosis.—In typical cases the classical clinical picture makes the diagnosis. The lesions are distributed chiefly over the middle third of the face, particularly on the nasolabial folds. Once present they remain for life. The disease begins in early life (fourth to fifth month as a rule) and the lesions develop slowly Frequently associated lesions consist of small capillary dilatations (telangiectases) and nevoid tumors.

In differential diagnosis, it may be distinguished from *multiple benign cystic epithelioma* by the location of lesions, the age of onset and the absence of ulceration. Histopathologic study will resolve any doubt. The typical distribution will aid in differentiation from *colloid milium,* in which furthermore the lesions are of a peculiar yellowish translucent color The persistence of the lesions is in contrast to *molluscum contagiosum* and in the latter a cheese-like sub-

Itching is absent. Some children complain of anorexia and loss of weight has been observed. Asthenia has been reported.

Diagnosis.—When pigmentation alone occurs, particularly when the pigmented areas are small, the condition may be overlooked. The presence of tumors on the skin makes diagnosis comparatively simple. The onset, character and distribution of the lesions is helpful. Neurofibromatosis of von Recklinghausen must nevertheless be differentiated from *urticaria pigmentosa* (in which there are no tumor formations and there is no itching) and from *Addison's disease* (in which there are constitutional symptoms and signs and generalized bronzing of the skin and pigmentation of the mucous membranes)

Complications.—The mentality is usually unaffected unless the ailment is accompanied by endocrine derangement. Imbecility and epilepsy have been reported. Congenital defects, xanthoma, subperiosteal bone cysts, pseudoarthrosis and fibrous dysplasia have been reported as not uncommon.

Prognosis.—The disease seldom undergoes spontaneous improvement. A few lesions may occasionally undergo regression. As a rule the condition is lifelong; that is, it is not incompatible with life. Usually the disease progresses although it may remain stationary for long periods. Life crises seem to provide growth stimulus, particularly puberty and pregnancy.

Treatment.—Surgical removal may be required for cosmetic effect or for large single, painful, malignant growths, but extensive involvement should be let alone because malignancy may follow removal.

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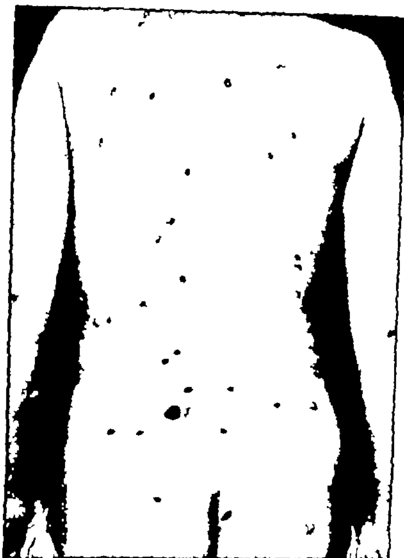


Fig. 172.—Neurofibromatosis in an adolescent. (Courtesy of Dr J P Guequierre.)

ever the deeper nerve tumors are tender and painful on pressure. An interesting feature of the disease, as Guin points out, is that neurofibroma may grow diffusely causing elephantiac hypertrophy and disfiguration of the part. As a process this may involve a digit, phalanx or limb, affecting the member so that it may become several times its normal size.

3 SKELETAL CHANGES —These changes have been well summarized by Leader and Grand

1 Spinal Curvatures
   a) scoliosis
   b) kyphosis.
2. Abnormalities of Growth of the Long Bones
   a) lengthening—if the pathologic condition is in the shaft
   b) shortening—if the changes occur at the epiphyses.
3 *Irregularities of Bone Outline.* These range from central and periosteal cysts to pedunculated subperiosteal tumors.

In the first two groups the lesions are clinically manifest but in the third type the condition goes unsuspected in the early stages unless detected by routine roentgen studies.

It should be pointed out that not every case shows all the manifestations. Incomplete or border forms in which only one of the cardinal signs is present are frequently seen instead of the full-blown clinical picture presented in the adult.

may resemble erysipelas or acute lymphangitis.

The condition should be differentiated from erythroblastosis, hypertrophy or hemihypertrophy acute Quincke s edema and giant urticaria, circumscribed myxedema, scleroderma, various circulatory diseases and infectious processes causing edema.

Mental disturbances, spina bifida, congenital heart disease, hydrocele and delayed puberty have been reported as complications or ac companying hereditary edema of the legs. Inflammatory changes may appear Verrucose formations may be found on the dorsal aspects of the toes.

Without complications the general health is good and the disease is not incompatible with long life The course is nevertheless chronic nd progressive.

Treatment.—The earlier the edema is re duced by mechanical means the better are the chances for improvement. Progressive fibrosis, which occurs in the later stages, minimizes the possible advantages of the compression effect.

Bandaging has been employed as a temporary means to reduce the swelling but the swelling recurs soon after it is discontinued. A better method is the use of adhesive tape or roller bandages. Elastic bandages and stockings and Unna paste have been employed.

For mild cases rest and elevation of the legs at frequent intervals apparently give the patient relief This physical means and properly fitted shoes may be all that are required for the patient' comfort. However unusually severe conditions call for the modified Kondoleon operation, which is considered the method of choice.

Recently dramatic results have been report ed from the use of prednisone in girl 11 years of age The dosage schedule was 30 mg daily for one eek 25 mg daily for one week 0 mg. daily for four days, 15 mg. daily for four days, and then maintenance dose of 10 mg daily in four doses The edema receded by approximately 80 per cent and attacks failed to recur

Telangiectases

(Generalized Angiomatosis)

Multiple telangiectasia has been classified (by Madden) as primary secondary and nevoid. Primary telangiectasia can include hereditary hemorrhagic telangiectasia, certain cases of familial hematuria epistaxis not due to the disease of the blood in which no obvious telangiectasias have been seen also, familial cases of telangiectasia without hemorrhage and certain possible examples of atavism without a family history Secondary telangiectasia includes generalized telangiectasia dependent on constitutional diseases, such as disease of the liver and leukemia and angiomatosis occurring in preg nancy The third, nevoid telangiectasia, may be present at birth, appear early in life or even oc cur in old age. Also generalized, punctiform, capillary ectasias which occur in people beyond middle life and spider telangiectasias which appear at any age, may be included in this subdivision.

Hereditary Hemorrhagic Telangiectasia

Osler s disease, Rendu-Osler Weber s syndrome.—This is an hereditary abnormality characterized by the formation of localized dilatations of capillaries and venules which occur chiefly on the skin of the face and on the mucosa of the nose and mouth and which may give rise to apparently spontaneous hemorrhages, most commonly in the form of recurrent epistaxis. The disease is transmitted by a dominant gene. Males and females are affected alike and are equally capable of transmitting the disease to their offspring. Dolowitz and his co-workers in a genetic study of 491 members of families traced for six generations found among them 83 cases of hereditary hemorrhagic tela gectasia The same authors in their study found that the ge of onset varies considerably Usually the first sign is nosebleeds occurring in childhood. The earliest occurred in an infant at three months, the latest in a man of 60 years.

Clinical Picture.—The skin lesions appear as small, red-purplish spots, usually pinpoint in size although sometimes they are larger and in some rar instances have spiderlike configuration. These lesions may or may not disappear on pressure. Pallor may or may not be present. Hemorrhage is the one constant symptom of the disease and the source of all the other symptoms In the majority of instances, the hemor rhage occurs in the form of epistaxis. Too in

26

Hereditary Anomalies

CERTAIN DERMATOSES of a hereditary nature have been discussed in other chapters. The four diseases described in this chapter are best considered together because of certain hereditary and familial features they possess in common. Furthermore it is important that they be diagnosed early because, although they are not readily amenable to therapy an awareness of *the possible implications often permits prevention* or control of accidental episodes during the course of the disease

Hereditary Edema of the Legs

(Milroy s Disease)

This rare hereditary disease is characterized by a persistent indolent edema of the lower extremities affecting one or both legs. It may be of the congenital type, present at birth or of the late or tardive type appearing in late childhood or early adulthood. The exact cause is unknown The disorder occurs in both sexes but perhaps more frequently in females. It has been variously attributed to some functional disturbance of the lymphatic venous circulation congenital malformation of the lymph vessels, vasomotor disturbances venous or lymphatic obstruction or thrombosis, and functional disturbances of the endocrines. Schroeder and Helwig Larsen believe that it is probably due to defective contractility of the arterioles in the subcutis of the lower extremities with the result that an abnormally large part of the arterial pressure is transmitted to the capillaries and so gives rise to filtration edema with secondary increased capillary permeability They explain the pronounced *fibrous degeneration of the subcutis on the basis* of the chronic edematous condition of the tissues. At the same time they remark that there *cannot be excluded the possibility of a primary* embryonal disturbance in the mesodermal tissue of the subcutis, with fibrosis, vascular changes *and heteroplastic appearance of smooth musculature.*

Swelling may be present at birth or it may *not appear until puberty or even adult life. The* condition may show progressive enlargement during the period of growth and development. *The edema may be limited to one extremity but* it is usually symmetrical involving both lower extremities. On the other hand it may be confined to *the feet alone. However it is nearly always confined to the lower extremities, not* reaching above Poupart s ligament. Edema of *the scrotum has also been reported.*

On physical examination the swelling, which appears quite firm pits only slightly after prolonged pressure or not at all. *The skin appears of* normal color and temperature There is no pain (although there may be some local discomfort) except during an acute attack. *There are no* constitutional symptoms.

The acute attacks, which are limited to cases *in late childhood or early adult life are char*acterized by episodes of chills and fever during which hyperemia occurs there is also increased edema, swelling and pain *of the affected extrem*ities. During these attacks the acute erythema

may resemble erysipelas or acute lymphangitis.

The condition should be differentiated from erythroblastosis, hypertrophy or hemihypertrophy acute Quincke's edema and giant urticaria, circumscribed myxedema, scleroderma, various circulatory diseases and infectious processes causing edema.

Mental disturbances, spina bifida, congenital heart disease, hydrocele and delayed puberty have been reported as complications or accompanying hereditary edema of the legs. Inflammatory changes may appear. Verrucose formations may be found on the dorsal aspects of the toes.

Without complications the general health is good and the disease is not incompatible with long life. The course is nevertheless chronic and progressive.

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Bandaging has been employed as temporary means to reduce the swelling but the swelling recurs soon after it is discontinued. A better method is the use of adhesive tape or roller bandages. Elastic bandages and stockings and Unna's paste have been employed.

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Clinical Picture.—The skin lesions appear as small, red-purplish spots, usually pinpoint in size although sometimes they are larger and in some rare instances have a spiderlike configuration. These lesions may or may not disappear on pressure. Pallor may or may not be present. Hemorrhage is the one constant symptom of the disease and the source of all the other symptoms. In the majority of instances, the hemorrhage occurs in the form of epistaxis. Too in

some patients hemorrhage may occur from telangiectasis on the tongue, lips fingers, or buccal mucous membrane and even from the rectum lungs, kidneys or vagina.

Multiple telangiectases are the outstanding feature of the skin. They may occur almost anywhere on the body: they are most commonly found on the buccal and oral mucous membranes and the lips, but have been noted also on the face, hands, feet ears, scalp neck forearms and chest.

Skin lesions need not always be present. In many cases the hemorrhages occur from the nasal mucous membranes and in certain cases there seems to be no obvious cutaneous angiomata or telangiectases so that such cases might simply be termed "familial epistaxis" or "familial telangiectatic epistaxis

Diagnosis.—The diagnostic criteria are (1) a definite hereditary tendency (2) visible typical telangiectasis and (3) a tendency to bleed from these lesions. The presence of a typical family history makes the diagnosis easy in many instances. On the other hand its absence does not preclude the diagnosis of this disease, and this *fact should be borne in mind in any case pre*senting obscure hemorrhagic phenomena. Hemophilia and purpura should be differentiated

Complications.—Secondary anemia as a result of hemorrhage may become severe and serious Fatal hemorrhage has been reported in several instances Cerebral hemorrhage may *cause convulsions and death. Lindau has de*scribed cases in which trigeminal nevi homolateral pial angiomas showing calcification on the roentgenogram and a unilateral glaucoma form a characteristic syndrome. The disease is often seen in children and in a few cases there is a family history Calcareous deposits may occur in the walls of the angiectatic vessels or in thrombosed channels or they may be extravascular as a result of hemorrhages or thrombotic necrosis. The relationship between hereditary hemorrhagic telangiectasia and familial cases of *Lindau's syndrome is speculative.*

Prognosis and Treatment—If hemorrhage is prevented or controlled, the disease is not inconsistent with longevity The hemorrhages tend to increase in frequency and severity until middle life The only treatment is symptomatic.

Sickle Cell Anemia

Sickle cell anemia is a chronic, familial, hemolytic anemia, peculiar almost if not entirely to the Negro race. It is characterized by sickle or oat-shaped erythrocytes, rheumatoid manifesta*tions, leg ulcers, bone changes,* anemic symptoms and attacks of acute abdominal pain. The sickle cell trait is a familial, nonanemic condition in which the abnormality recognized is sickling of the erythrocytes under conditions which reduce the hemoglobin

Etiology—Sickle cell anemia is both hered*itary and congenital. It is generally accepted,* that sickle cell anemia and the sickle cell traits are due to some inherent defect in the red blood cells. The disease is seen almost exclusively in Negroes although cases among Sicilians and Greeks have been reported. Poor circulation in the lower legs and a tendency toward thrombosis *are supposed to be etiologic factors.*

Clinical Picture—The most important single clinical finding is leg ulcers (Fig. 173) but they are only seldom found in children under the age of puberty The ulcers are most commonly found on the ankles, particularly on the inner side just above the ankle, but they can occur anywhere on the leg and may be found on one or both legs. No portion of the skin is really exempt. They are about the size of a 25-cent piece, or larger and are usually discrete and sharply marginated, round or oval and "punched out *in appearance. They may be shallow* or deep. The borders may be elevated and even irregular There is a granulating base which occasionally suppurates. The ulcers are indolent and heal slowly over a period of months or perhaps a year The scar is thin, atrophic, pliable smooth, glossy apigmented and often surrounded by an apigmented areola. Minor injuries, bruises and scratches may be responsible for initiating the ulcer probably owing to the lowered resistance of the anemic patient. The ulcer may be the only symptom complained of or it may ap*pear either before* or after the other symptoms of the disease.

The one sign that brings the patient to the physician is jaundice, which is seen on the sclerae and on the skin. It differs from icterus neonato*rum in that the yellowish discoloration* of the

sclera and the skin persist and becomes worse instead of clearing up at the end of a week or ten days. Pain in the extremities and abdominal pain occur rather frequently as well as anorexia, weakness, irritability and somnolence. Low grade fever is frequently found. Lymphadenopathy is a frequent finding, especially of the cervical nodes.

Diagnosis.—The possibility of sickle-cell anemia should be considered in icterus of the new born. There are certain clinical symptoms that are common to all the active cases. They are (1) discoloration of the sclerae, (2) a hemoglobin under 50 per cent, (3) sickle cell in the smear moderate leukocytosis, urobilin in the urine increased icteric index, indirect delayed van den Bergh reaction, (4) normal fragility of the red cells without increased hemolysis on standing at room or body temperature and (5) a history of attacks of vomiting, abdominal pain or pains in the joints, a systolic murmur and a slight enlargement of the heart (present in most cases) Also, a generalized mild adenopathy is usually present.

Sickle-cell anemia should almost always be the primary consideration in the differential diagnosis of leg ulcers in the Negro.

Differential Diagnosis.—The leg ulcer of sickle cell anemia can be differentiated from *syphilitic ulcer* by the characteristic configuration of the latter which is usually unilateral and located over the calf, as well as by the history and blood serologic test from *traumatic ulcer* it can be differentiated by the history and by the fact that a traumatic ulcer heals readily with rest of the extremity and local antiphlogistic treatment. The disease should be differentiated also from *sickle*mia, an asymptomatic sickling trait that is more common than sickle-cell anemia and occurs in about 7–8 per cent of the Negro population. *Scrofuloderma* can be ruled out by tuberculin test. *Erythema induratum*, in which the lesions are painless and usually appear on the calf can best be differentiated in difficult cases by histopathologic study

Complications.—Families with the sickle-cell trait have a high child mortality The children are more likely to be subjects of malnutrition and underdevelopment and therefore also to be more susceptible to various intercurrent infections. An enlarged heart, systolic murmurs, cardiac failure, involvement of the lungs, infarct of the kidney (producing hematuria) enlarged liver and spleen, bone changes, and central nerve changes secondary to thrombosis may occur

Prognosis.—Sicklemia among infants should lead one to give a guarded prognosis. The earlier the onset, the graver the prognosis. Before the introduction of antibiotic therapy patients who suffered from this condition succumbed quite easily to intercurrent illnesses.



Fig. 171 —Sickle cell anemia in boy 12 years of age The patient had all the classical symptoms. (Courtesy f Dr Roland B Scott, Washington, D C.)

Prophylaxis and Treatment.—Foci of infection (e.g., diseased tonsils) should be sought for and removed. Reports of many workers definitely indicate that the mating of a person carrying the sickling trait with another person bearing the thalassemia trait can result in a disease in the offspring indistinguishable from sickle cell anemia. Accordingly marriage among such persons should be discouraged.

Treatment is essentially supportive and symptomatic. ACTH and cortisone are of value in relieving the acute pain and distress associated

with the crisis of sickle-cell disease Repeated blood transfusions are indicated for the anemia sulfonamides and antibiotics *are called for if* intercurrent infection is present.

See Formulary ℞ 66 antiphlogistic 103 105 for secondary anemia in younger child 107 for secondary anemia in older child

Xeroderma Pigmentosum

(Kaposi's Disease)

Xeroderma pigmentosum is a rare disease of congenital origin characterized by hyperpigmentation white atrophic spots and telangiectasia followed by superficial ulceration and warty and malignant growths.

The exact cause is unknown although undoubtedly those subject to the ailment are hypersensitive *to the actinic rays of the sun,* which furthermore worsens the condition Consanguinity of parents is believed to be a predisposing factor with heredity following the recessive Mendelian pattern The disease is also familial but it is usually confined to one sex in the family Pigmented races are apparently not immune to the disease as was once believed reports of instances in dark-skinned persons include Africans and Singhalese

Clinical Picture and Diagnosis.—The disease is first noticed before the third year of life frequently appearing in the first year The earliest lesions consist of freckles which vary in size *from tiny specks to irregularly outlined pig* mented macules of a dark sepia or chocolate color These are first noticed on the exposed parts of the body such as the face and hands On the other hand the first manifestation may be an erythema or *dermatitis. The usual story is that* some time in the infant s first spring or summer after more than usual exposure to the sunlight he became badly sunburned Freckles then appeared on the face and hands and less so on the legs i e over areas exposed directly to the sun rather than regions covered by clothing. Al*though with the onset* of late fall and winter recovery occurred when summer came again the condition recurred.

There are seen linear or stellate telangiectasia and, upon closer inspection capillary angiomata which appear as *bright red rounded spots of* different sizes scattered over the pigmented areas of the skin. Favorite sites are the ear margins, *tip of the nose, mouth* and *especially the* mucocutaneous junctures. Atrophic areas are found, *of an irregular outline and characterized by* a smooth, dry and wrinkled cigarette-paper-like surface light brown in color which produces a definite contrast to the rest of the pigmented surface. Removal of the angiomata results in scars, contractures and considerable physical discomfort and annoyance, e.g., obstruction of the opening *to the nose. After a period of months* or years, the skin assumes a rough and scaly condition with a tendency to develop thickenings or warty growths at the sites of some of the pigmented spots, at this stage bearing a close resemblance to senile keratoses. The growths may attain considerable size unless they are curetted deeply however when curettement is properly carried out return does not usually take place. Superficial ulceration due to secondary infection with pyogenic microorganisms produces numerous disfiguring scars (Fig 174) These *may be seen on the dorsa of the hands* face and neck, and may be intermingled among freckle-like, pigmented areas scattered over the face In contrast the skin of the abdomen and chest remains normal

Finally malignant growths appear These of the basal cell type of epithelioma (rodent ulcer type) *are especially prone to appear* at the mucocutaneous borders such as about the mouth and nose. The mucous membranes may share in these changes Indeed not uncommonly pigmentation telangiectatic spots and malignant changes are also seen *on the mucous membrane*

Generally speaking, metastasis is absent ei*ther in* the internal organs or in the lymphatic channels. During the early stages, subjective symptoms are absent and there is no interference with *the* general health In the late stages, however with the onset of ulceration and car*cinomatous growths, pain* is followed by progressive lowering of vitality and malnutrition and *the* condition then ends fatally sooner or later

Strong sunlight is annoying and even painful to the eyes. Photophobia *may be troublesome* and older children may complain of inability to tolerate daylight to such an extent as to interfere



Fig. 174.—Xeroderma pigmentosum. There is marked bilateral ectropion. The conjunctivae are inflamed. Note the scarring about the nose and cheeks which ultimately gave rise to the ectropion. (By permission from Martin, Hayes E Copeland, M M and Martin, H E Am. J Cancer 16 1337 1357 November 1932.)

ith playing of games. The lids may be turned in against the cornea due to epitheliomata. Later partial destruction of the lids and their eversion from the eyeball may by leaving the cornea unprotected lead to ulcerative keratitis, this in turn is followed by opacities of the cornea and partial blindness.

Diagnosis is comparatively simple in the full-blown case and rests upon familial history and the clinical picture already described. In differential diagnosis, watching the patient over period for the appearance of other lesions will establish whether the diagnosis is xeroderma pigmentosa or simple freckles The history will aid in differentiation from -ray dermatitis or undue exposure to weather and the sun. Differentiation from *Darier disease* can be made by the symmetrical distribution in the latter of the papular eruption with crusts, which leave a bleeding surface when they are removed.

Complications and Prognosis.—Basal and prickle cell epitheliomas are common complications. Contracture of the eyelids may cause serious entropion. The unsightly appearance of the face and other areas of the skin may cause the child to be shunned by others and so result in an inferiority complex and a state of depression. Mental pathy has been described in some patients

The prognosis is poor Xeroderma pigmentosum is a fatal skin disease and is classed as a malignant disorder Most authorities agree that it is rare for patients to survive beyond 20 years of age. Indeed most children die before puberty Xeroderma pigmentosum rarely metastasizes to internal organs Death is usually due to inanition.

Prophylaxis and Treatment—Prophylaxis consists in avoiding exposure to the sun. Protective devices against the sun such as sun-screens in the form of lotions, ointments and creams should be used when exposure cannot be avoided.

There are no specific curative measures. Treatment is entirely symptomatic. As the growths appear they should be removed by means of the curette. Epitheliomas should be excised and the skin curetted or treated by irradiation. When entropion occurs the eyelashes may have to be destroyed by electrolysis because they may cause irritation of the cornea that can result in corneal ulcer.

Photophobia may be relieved by the wearing of sunglasses.

Representative Prescriptions

See Hydroa Aestivale p 187

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Tumors of the Skin

IN THIS CHAPTER are discussed new growths and the lymphoblastomas and related cutaneous disorders. Although there is some difference of opinion regarding classification Hodgkin's disease of the skin is included in the latter group of malignancies. Malignancies, while relatively uncommon in children as compared to adults, are of practical importance. Every clinician should be alert to the fact that they do occur in childhood so that early recognition can be followed by early treatment.

Basal-Cell Epithelioma

Basal-cell epithelioma may occur anywhere on the skin except on the palms and soles. The periorbital region is by far the most common site. The mucous membranes are never affected. It usually occurs as a single lesion but multiple lesions are not infrequent. Three types have been described (1) nodulo-ulcerative (including rodent ulcer) ( ) pigmented and (3) superficial Metastases are unusual.

The *nodulo-ulcerative* type, the most common, appears first as small waxy nodule. The surface may present number of telangiectatic vessels. The nodule gradually increases in size and undergoes central ulceration this later slowly increases in size and becomes surrounded by pearly rolled border (rodent ulcer) The difference between the nodulo-ulcerative type and the *pigmented* basal-cell type is the dark pigmentation of the latter *S perficial* basal-cell epitheliomas are characterized by one or more erythematous, scaly slightly infiltrated patches and are surrounded by a fine threadlike border The patches usually show small areas of superficial ulceration and crusts. The centers may show smooth, atrophic scarring.

Diagnosis depends upon purely objective symptoms corroborated by histopathologic study I children cancerous growths are less likely to be superficial and less likely to ulcerate early than in adults. In differential diagnosis, xeroderma pigmentosum and epithelioma adenoids cysticum will need to be considered, but histopathologic study will establish the diagnosis.

BASAL-CELL EPITHELIOMA PERSTANS

A type of basal-cell epithelioma has been reported which persists from childhood into adulthood without appreciable change. The characteristic manifestation of the lesion consists of a well demarcated, circular firm, smooth surfaced, slightly depigmented papule. In most cases reported the tumor had a central depression.

Squamous-Cell Carcinoma

Squamous-cell carcinoma may occur anywhere on the skin or mucous membrane. The lesion consists of a shallow ulcer surrounded by a wide, elevated and indurated border The ulcer may be covered by a crust which when removed leaves red granular base. Metastases occur

With early recognition of squamous-cell car

cinoma the prognosis is favorable Follow-up studies have been made that include children in their early teens who in infancy or early child hood, were successfully treated and had no recurrence

Melanoma

(Melanocarcinoma)

The term "melanoma" is given to any abnormal collection of melanin-pigmented cells whether in the skin the eye or elsewhere. Melanomas include tumors of widely diversified histologic

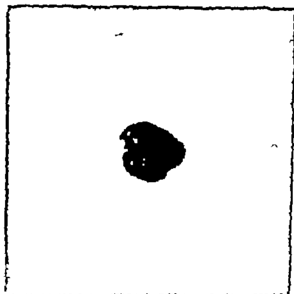


Fig 175 —Melanoma on the left shoulder of a boy 10 years of age. (Courtesy of Dr Meyer L. Niedelman.)

structure. There are two main types the pre pubertal benign juvenile melanoma and the malignant melanoma. According to Bachhuber and Bischel the prepubertal juvenile melanoma, although it presents some of the histologic features of malignancy has the biological activity of a benign lesion. In some instances after puberty this type of dermal nevus then takes on all of the characteristics of true malignancy The classification is justified by distinct histopathologic features which serve to differentiate it from the malignant.

While malignant melanoma is essentially a disease of middle life, it may occur at any age. It occurs more often in males than in females and more often in the white race than in Negroes. In most cases it has occurred in the unpigmented mole. Malignant melanomas are more likely to occur in moles situated in areas frequently subjected to trauma, such as the lower extremities, especially the feet and the head. An uncommon site is the nail bed (melanotic whitlow of Hutchinson) Pack and Anglem found that of 483 malignant melanomas in all age groups studied at the Memorial Hospital New York, only 12 (2.7 per cent) occurred in patients under 16 years of age.

Clinical Picture—The lesion almost invariably begins as a nevus (junction) which may be either macular or papular It is smooth, nonhairy and of a slate blue or black color In the so-called amelanotic melanoma however the color of the skin may be normal. Probably the sign first noticed by the patient or the parents is an increase in the size of a nevus. The increase in size may be manifested by a somewhat heaped up appearance so that the birthmark not only looks but feels elevated often it appears as a small nodule definitely firmer and harder than it was originally Again there may be a number of individual nodules in a patch or cluster Similar lesions, nodules or a patch of nodules, may appear at a short distance from the original nodule—so-called "satellite nodules." About the same time as the original lesion begins to enlarge, or possibly soon thereafter a definite increase in the pigmentation of the lesion is noticed, so that the color changes from a slate blue to a sepia or coal black. This increase in the pigment cells (melanocytes) is probably the most important clinical feature of a malignant melanoma (Fig. 175) especially from a diagnostic standpoint. Bleeding is another important sign but it usually appears late (after months) Eventually the lesion undergoes ulceration, which is followed by a hemorrhagic crust. Somewhat later the regional lymph nodes may be found to be enlarged. Metastasis occurs especially in the liver and lungs, but any organ may become involved Melanotic lesions may occur not only in the skin but on the mucous membranes and even in the eyes.

When the nail bed is affected (occasionally the nail fold) the lesion in that locality is referred to as melanotic whitlow" (or subungual melanoma) In its clinical appearance melanotic

whitlow resembles the ordinary inflammatory whitlow except that the inflamed area is surrounded by a fine black border and verrucous-like elements appear over the involved area. The nail is usually shed and the regional lymph glands are enlarged.

Diagnosis.—The triad of signs upon which a diagnosis of malignant melanoma may safely be made is a smooth, slate blue, nonhairy nevus especially one located on the extremities or forehead, which undergoes (1) increase in size, ( ) increase in pigmentation and (3) bleeding. Ulceration and bleeding are usually late signs, as is also the development of satellite lesions and adenopathy In children differential diagnosis requires consideration of the common mole, blue nevus and pigmented basal cell epithelioma. If there is difficulty biopsy will settle the matter

Prognosis.—The prognosis is usually good before the age of puberty once the lesion is removed by a wide excision.

Prophylaxis and Treatment.—Although it is impractical to remove all pigmented nevi, those situated in areas subjected to trauma or to repeated and constant irritation or friction are best removed surgically

There is only one treatment for malignant melanoma—wide excision of the lesion immediately after diagnosis has been reached. Some authorities believe that the ideal treatment combines roentgen or radium with surgery

Keloid

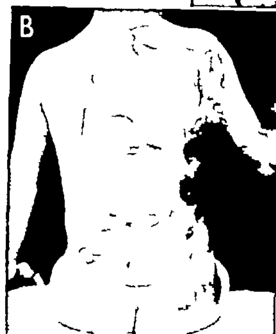
A keloid is dense fibrous growth which develops in mesodermal tissue usually at the site of scar and which is characteristically smooth, firm, reddish, scarlike tumor It may be simple or multiple. The exact cause is unknown. Trauma in some form seems to be the important factor initiating the growth. Keloids following trauma are seen to arise from surgical scars, burns, ulceration, accidental cuts, scratches, vaccination needling and pyodermic processes. An example of keloids following infection is the hypertrophic scar seen on the neck from the healing of tuberculous lymph glands (scrofuloderma) They are sometimes seen resulting from the piercing of the earlobes, practice common among girls and women prior to inserting earrings. Bites of insects also may serve as an exciting cause.

Keloids are uncommon in infancy The highest incidence appears between 10 and 20 years. Marshall and Rosenthal postulate that there must be an intense tissue edema with increased circulating fibrin in the background for this type of lesion. They explain that in normal wound healing fibrous tissue formation ceases as soon as continuity is reestablished. Keloids, however are formed by the continued proliferation of fibroblasts. They develop slowly At first the lesion appears as a hyperemic, small, deep-seated, firm, smooth, ovoid nodule, which may be felt deep in the skin and which is somewhat elastic. The surface of the lesion is smooth the overlying skin is somewhat atrophied and traversed by numerous dilated blood capillaries (telangiectasia) When fully developed the lesions are either oval-shaped or elongated and irregular are hard and present clawlike projections (crablike type) (Fig. 176, *A B C*) The color varies from pink to red or white and the lesion is often surrounded by an erythematous halo. Keloids vary in size and number in different patients. The most common site is over the sternum other areas include the face, neck, ear lobes, axillae, abdomen and extremities.

The *diagnosis* is based on a history of trauma, and on the distribution, color consistency and pattern of the lesions as already described. The most common site is over the sternum other areas may be affected. The configuration, tendency to lateral invasion and failure to regress all are in contrast to *hypertrophic scars* (Fig. 177) and help in differential diagnosis. Once keloids have reached their full development they remain as such. Spontaneous regression seldom occurs.

There are three methods of *treatment* (1) radiotherapy (2) excision followed by roentgenotherapy and (3) refrigeration by carbon dioxide snow It seems that best results are obtained from x-ray irradiation, particularly in lesions not yet fully organized (less than four months old) After the cells are fully organized, they are less radiosensitive. Treatment with solid carbon dioxide snow is often successful with smaller keloids. Moderate pressure should be applied for period of one minute to 75 sec





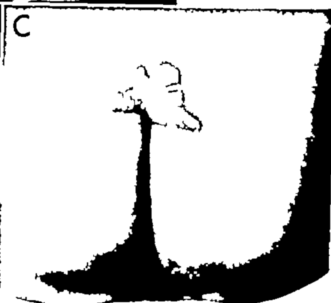


Fig. 176.—Keloid. A and B from burns (*A* courtesy of Dr Herbert M Leavitt *C* courtesy of Dr Meyer L. Niedelman.)



Fig 177.—Hypertrophic scars from chickenpox in a child 10 years of age Several small, pigmented, flat scars remained on the trunk also.

ods, and this treatment should be repeated once weekly or once every two weeks for six treatments. Recently considerable interest has been aroused from the use of corticotropin (ACTH) systemically and by local injection.

Calcifying Epithelioma of Malherbe

This slowly growing, benign tumor of the skin is uncommon but by no means rare. It may be found in any age even in infancy but is usually encountered in young adults. It occurs in both sexes but is more frequent in females. The condition is apparently not familial. There is evidence suggesting that it follows trauma and there is a theory that it develops from immature hair-matrix cells and is a tumor derived from a primary epithelial germ.

The lesion usually appears as a discrete, solitary slowly growing nodule hard to the touch and 1 to 3 cm. in size. The lesions seldom grow larger than a walnut and are adherent to but freely movable with the skin. The most common location is anywhere on the head, face, neck or upper eyelid or on the upper extremity. Less frequently other areas of the skin may be involved. On sectioning such tumors, they feel gritty. The condition is asymptomatic and there is no adenopathy.

The diagnosis is seldom made clinically but is apparent on histopathologic study.

Clinically the lesion is often mistaken for a *sebaceous cyst* or an *epidermoid cyst*. Sometimes the age of the patient will rule these out, since they seldom develop before puberty. *Xanthoma tuberosum* also may be thought of, but histopathologic study will clear up any doubt.

Treatment consists in surgical excision of the lesion with care to go well beyond the border so as to ensure complete removal of the capsule. When these tumors are completely removed they seldom recur.

Lipoma

A lipoma is dermal or subcutaneous new growth composed of fat cells enclosed within capsule of connective tissue. The condition is seen at all ages but is more common in middle life. The exact cause is unknown. I addition to the embryonic theory trauma and heredity are said to be factors in the etiology. An inherited tendency to simple or multiple lipomas in one generation is rare. Muller has reported an instance in which all five children in the family as well as the father suffered from typical, multiple, circumscribed lipomas. The children of the father and of the mother resulting from second marriages showed no such abnormalities.



Fig. 178.—Lipoma in 10-month-old infant. The boggy mass measured 7.6 x 7.6 cm. It began as lump present at birth, about the size of an egg and gradually increased in size. The mass was fluctuant and freely movable. The diagnosis was confirmed by biopsy and the mass was removed surgically.

Muller states categorically that the disease is hereditary and that transmission is not sex linked but is probably simply dominant.

Lipoma occurs as a translucent swelling, subcutaneous, soft, elastic, lobulated, rounded and usually freely movable (Fig. 178). It may be single or multiple. The tumors vary in size from that of a hazel nut to that of an infant' head. They usually increase in size slowly oc casionally rapidly and then remain stationary

There are no subjective symptoms. While lipomas may occur anywhere on the body the sites of predilection are the neck, back shoulders and buttocks. Some of the congenital lipomas show progressive growth and may attain a large size, thus indicating their neoplastic nature.

They can be differentiated from *myomas* by the fact that the latter are solid tumors and not freely movable and in contrast to *cysts* they are nonfluctuant and will yield no fluid on aspiration Secondary changes such as calcification ossification edematous changes and liquefaction sometimes occur in larger tumors The lesions remain benign. The *treatment* is surgical removal

Histiocytoma

(Nodulus Cutaneus)

Nodulus cutaneus is a localized form of cutaneous reticulo-endotheliosis characterized by the appearance of fibromalike nodules usually appearing in greatest number on the legs. The term nodular subepidermal fibrosis, coined by Michelson is perhaps the most descriptive designation for the condition.

The exact cause is unknown. In some instances the condition has been preceded by a trivial injury such as a scratch or has followed the use of a hypodermic needle in a few instances, the lesions have followed mosquito bite. However in most cases the onset is insidious unattributable to any cause The condition occurs in both sexes.

Clinical Picture.—First a small discrete and easily palpated nodule is noticed (Fig. 179) *It is quite hard and firm. As a rule,* the lesions are few in number oval or round with an average size of 0 5 cm. After reaching a certain size they become stationary Their color varies from pink (early lesions) to a deep red or brown (older lesions) and older nodes may even be an ivory color They show a smooth surface although when examined closely with a hand lens, the follicles can sometimes be made out and occasionally there may even be a depression in the center They are sharply distinguished from the surrounding skin because of their slight elevation and they can be felt extending to the hypoderm. However because they are definitely not attached to the subcutaneous tissue, they are freely movable. They may occur anywhere on the body although most of them are distributed over the anterior tibial surfaces of the legs. Other areas include the extensor surfaces of the forearms, the abdominal walls, back and face. There are no subjective symptoms and apart from the fact that the patient may be conscious of their presence they cause no discomfort whatsoever

Diagnosis.—The diagnosis is made from the clinical picture already described. The lesions are slow growing but sharply demarcated from the surrounding skin nontender and nonpainful.



Fig. 179.—Histiocytoma (also known as nodulus cutaneus, fibroma durum and sclerosing hemangioma) in an infant in whom it was present since birth. Note the several sharply defined, rounded, pea-sized nodules that are firm and smooth Diagnosis was confirmed histopathologically (Courtesy of Dr Meyer L. Niedelman.)

It is sometimes difficult to distinguish the condition from *dermatofibroma* In the latter however *the lesions are elevated higher* above the skin surface than those of histiocytoma cutis and of a softer consistency The history and the shape and color of lesions will differentiate it from *keloids* and of course, histopathologic study will resolve any doubt. The pale yellow color of the lesion distinguishes it from *xanthoma* in which furthermore the lesions are numerous and more definitely elevated. *Molluscum contagiosum* can be ruled out by the inability to express a cheese-like substance from

the lesion and the fact that the lesions of the latter are multiple.

The slower growth and non-invasive character of histiocytoma will differentiate it from the rapid-growing *fibrosarcoma*, which furthermore is rare in children. Nevertheless, histopathologic study may be required. There should be no difficulty in distinguishing it from *pigmented nevus* or from *malignant melanoma*.

Prognosis.—In general, once present and having attained maturity the lesion remains stationary throughout life. Instances have been reported of reabsorption or spontaneous and complete disappearance of histiocytomas. The lesion is essentially benign, however nd as far as is known has never been followed by fibrosarcoma or basal-cell epithelioma.

Treatment.—The lesions may be removed for cosmetic effect; otherwise they should be left alone. Surgical excision is the method of choice with care to excise them completely lest regrowth occur If it does occur second excision may be successful. Roentgen ray therapy and carbon dioxide snow have proved ineffective.

The Lymphoblastomas and Related Disorders of the Skin

This group of skin conditions includes leukemia, Hodgkin s disease and mycosis fungoides. Mycosis fungoides is practically never seen in infants and children. All of these diseases have tumorlike features and are related by a common characteristic cell, the lymphoblast or a derivative of it. A Wiener has explained, the neoplastic features are found in the continuous and uncontrolled proliferation of cells which tend to differentiate like their cells of origin. The proliferation is infiltrating and is devoid of an orderly structural arrangement.

Leukemia Cutis

Leukemia cutis is a fatal disease of unknown etiology primarily involving the blood-forming organs (bone marrow spleen, lymphatic nodes and reticuloendothelial cells) and characterized by a widespread, rapid and disorderly proliferation of the whit blood cells and their precursors.

The exact cause is unknown. Leukemia affects all ages, particularly children in the first decade of life and adults after the age of 50.

Acute lymphatic leukemia cutis.—Acute lymphatic leukemia cutis usually affects children and young adults in contrast to leukemia that is seen in middle-aged and elderly persons. In children, the disease is extremely acute and stormy in contrast to that form of the disease seen in later life which runs a slower course.

Congenital leukemia cutis.—Congenital leukemia, an exceedingly uncommon disease, includes cases of proved leukemia which occur in the newborn period. Caffli *et al* state that only 1 case reports of leukemia occurring within the neonatal period can be accurately classified as congenital. These investigators, from a review of the literature, believe that the majority of cases reported as congenital leukemia offer little or no proof that the disease was actually congenital. Berhard *et al.* compiled from the literature 14 acceptable cases of congenital leukemia. These investigators insist that in order for a case to fulfill the criteria of congenital leukemia there must be manifest at birth or shortly thereafter symptoms or signs which can be correlated with the characteristic hematologic disturbance and the recognition of the latter may be delayed.

Chronic myelogenous leukemia cutis.—Chronic myelogenous leukemia cutis is uncommon in children, rare in infancy seldom occurring in infants less than 6 months of age. The rarity of it is attested by the few reports in the literature. Cooke has reported three cases encountered in the St. Louis Children s Hospital during 15 years among patients 8 years of age or older

Monocytic leukemia cutis.—Monocytic leukemia cutis is comparatively rare among infants and children. In general, the clinical picture does not differ from the skin manifestations seen in other leukemias.

Cutaneous Manifestations.—Although there is no cutaneous manifestation that gives clinical proof of a specific type of leukemia, one of the most constant features is the occurrence of hemorrhages either into or beneath the skin. The petechial rash may appear all over the body or it may be limited to small area. Frequently it occurs in the form of successive crops coming on for no apparent reason and bearing no relation

to the severity of the disease. The parent sometimes notices that the child bruises easily and during the course of the illness large extravasations may take place. Probably the most common site of these ecchymoses is in the region of the sacrum Bleeding from the mucous membranes also is common In most cases there is hemorrhage from the gums which occurs as a persistent oozing of blood and which may be a permanent factor in the production of anemia Bleeding from the gums as the principal symptom may lead to a faulty diagnosis of infantile scurvy Epistaxis is another common symptom when it occurs it is usually severe, prolonged and likely to recur Bleeding from the bowel is common and hematemesis occurs in a few cases. Hematuria is rare The more severe forms of purpura are generally associated with a marked decrease in the number of blood platelets such as is usually found in lymphatic leukemia

Edema may be localized to the face or ankles or generalized and associated with ascites. In some cases tumors may be present in the skin they are referred to (by Ward) as nodular leukemia The cutaneous nodules may vary in size from pinhead to cricket ball Their color varies considerably depending upon whether the lesions are situated high in the cutis or deeper in the true skin and upon whether they have been affected by interstitial hemorrhages. Smaller lesions may involute and disappear completely

The nonspecific as well as the specific skin manifestations in *acute leukemia* are essentially the same as in chronic cases. Nonspecific eruptions seem to have a purpuric tendency Specific leukemic lesions show a greater tendency to regressive changes such as central softening, ulceration necrosis and gangrene

Petechiae may be the only sign noticed on the skin or several moderate sized ecchymoses may be found on the trunk and on the extremities. Purpuric spots are common. Hemorrhage in the tonsils and on the oral mucosa may be the first signs. The oral mucosa may show signs of inflammation and gangrenous lesions. Petechiae may be discovered on the mucous membranes of the mouth In acute monocytic leukemia diffuse swelling of the gingivae with a tendency for the teeth to become submerged in the gums is encountered in the great majority of cases In fact Forkner asserts that this lesion is almost always pathognomonic of this type of leukemia. Frequently the disease is ushered in with enlarged tonsils or as a stomatitis. Acute leukemia may be initiated by symptoms resembling an acute infection.

In *congenital leukemia cutis* significant physical manifestations are spontaneous hemorrhages of the skin and mucous membranes, nodular skin infiltrations, enlargement of the liver and spleen adenopathy fever and pallor The blood should reflect an alteration of the marrow by showing an undue proportion of poorly differentiated or undifferentiated cells, usually of the granulocytic series Ideally there should be confirmatory bone marrow studies. In most cases a considerable elevation of the white blood cell count and a reduction of red cells and platelets are observed Nucleated red blood cells may be present in varying numbers.

Interesting are the dermatologic lesions reported by Casilli simulating urticaria pigmentosa. The histopathologic diagnosis also was consist·nt with urticaria pigmentosa. The eruption consisted of the discrete yet confluent yellowish brown and reddish-purple macules, papules and nodules firm on palpation and varying in diameter from matchhead to pea. Darier's sign was positive when further studies disclosed a hematologic diagnosis of acute myeloblastic leukemia the skin lesions were interpreted as leukemia cutis

In *chronic myelogenous leukemia cutis* the skin manifestations are much rarer than in lymphoid leukemia All the skin manifestations observed in chronic lymphatic leukemia have been observed in the chronic myeloid type.

Clinically the dermatologic signs may be bizarre and variable. However numerous skin hemorrhages (petechiae) and hemorrhage of the mucous membrane are common.

Prognosis.—Acute leukemia either runs a fulminating course and terminates in death within a few days or else it extends over a period of weeks or months before ending fatally Remissions may occur

Treatment—The treatment of leukemia cutis is essentially that of the underlying disease. The treatment of chronic leukemia comprises three categories of procedure (1) irradiation, (2) chemotherapeutic agents and (3) supportive treatment.

Chemotherapeutic agents include the use of folic acid antagonists and of ACTH or cortisone. Many investigators have found that a higher percentage of temporary remissions can be achieved with ACTH than by any other agent. The antibiotics are given routinely during the acute infectious period as well as during the period of toxicity because of the frequency and seriousness of infections that occur in the leukemic child. Supportive therapy includes the use of blood transfusions in addition to antibiotics. They are of definite value in prolonging life and adding to the patient's comfort. Antiphlogistic treatment is often helpful topically. Aluminum acetate (Burow's) emulsion or a paste consisting of 10 parts of aluminum acetate, 20 parts of anhydrous lanolin and 30 parts of the simple Lassar's paste may be used to advantage.

Hodgkin's Disease of the Skin (Pseudo-Leukemia)

Hodgkin's disease of the skin is a chronic disorder of the lymphatic system, of unknown origin, characterized by painless, progressive enlargement of the lymph nodes, progressive anemia, enlargement of the spleen, chronic intermittent fever, pruritus and fatal termination.

The cutaneous manifestations have been divided into main groups: (1) the nonspecific or toxic eruptions ("ides") and (2) the specific or true lymphogranulomatous lesions. The latter type is sometimes referred to as the essential type, in which there are definite plaques and nodules with a typical Hodgkin's picture seen microscopically. In the nonspecific type, as a rule the typical microscopic changes of Hodgkin's disease do not show.

Opinion is divided as to etiology. It is thought (1) that the disease is an infection, (2) that it is a neoplasm and (3) that the etiology lies between an infectious and a neoplastic process. Specific "causative" organisms and viruses have from time to time been reported.

Hodgkin's disease is known to occur in all races and in all ages as well as in nearly all nationalities. In the United States it is apparently more common in the white, native-born.

The nonspecific (toxic) eruptions include (1) pruritus with or without excoriations, pyodermas and lichenifications, (2) pigmentation, (3) prurigo-like eruptions, (4) bullous or pemphigoid lesions, (5) exfoliating erythrodermas, (6) purpuric lesions, scarletiniform and morbilliform eruptions, urticaria and erythema nodosum-like eruptions and (7) trophic disturbances such as loss of hair and secondary changes of the nails.

Specific lesions appear as nodules, tumors or gummalike infiltrations in localized, disseminated or corymbose arrangement. Itching is a variable symptom, sometimes present, sometimes absent. Herpes zoster may occasionally be seen.

The management of the disease is both supportive and palliative. The treatment of the skin lesions is essentially that of the disease itself. ACTH and cortisone are of temporary benefit.

Corns (Clavi) and Callosities (Calli)

Both corns and calluses are due to friction and pressure, corns most commonly to tight-fitting shoes. There are two types of corn, hard and soft. *Hard corns* usually occur on a toe. They are characterized by circumscribed hyperkeratotic thickenings, the apex of the triangular thickened area of the skin being directed downward and the base appearing elevated over the lesion. Pain is due to the core of the corn pressing on the sensory nerves in the skin. The object in treatment is to relieve the pain and discomfort, to destroy the corn and to prevent a recurrence. Corn pads are useful for preventing pressure on the corn. The corn may be destroyed by excision or with strong keratolytics. After the hard corn is pared with a sharp razor or scalpel, it is treated by careful application of full strength dichloracetic or trichloracetic acid. Applications may be repeated every alternate night. Or the following prescription may be applied to the corn with a cotton applicator after first soaking the foot in a warm solution of 1 tablespoonful of sodium thiosulfate in 2 qt. of water.

℞

Salicylic acid 5-10%	1.5-3.0 Gm.
Lactic acid	4.0-8.0 cc.
Collodion	30.0 cc.
Misce et fiat collodion	
Signa: Apply to corn before retiring	

Soft corns occur between the toes where they

to the severity of the disease The parent sometimes notices that the child bruises easily and during the course of the illness large extravasations may take place Probably the most common site of these ecchymoses is in the region of the sacrum Bleeding from the mucous membranes also is common In most cases there is hemorrhage from the gums which occurs as a persistent oozing of blood and which may be a permanent factor in the production of anemia. Bleeding from the gums as the principal symptom may lead to a faulty diagnosis of infantile scurvy Epistaxis is another common symptom when it occurs it is usually severe, prolonged and likely to recur Bleeding from the bowel is common and hematemesis occurs in a few cases. Hematuria is rare The more severe forms of purpura are generally associated with a marked decrease in the number of blood platelets such as is usually found in lymphatic leukemia

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28

Diseases of the Hair and Nails

LIKE THE SKIN the hair and nails are derived from the ectoderm. Accordingly it would seem that lesions and disorders of the hair and nails frequently are associated with or follow certain dermatoses. However although the hair nails and skin share in many ectodermal defects, disorders of both the hair and the nails often occur independently of each other Disorders of the hair and nails dependent upon hereditary influences and due to intrauterine developmental states are usually seen soon after birth. Such defects usually are permanent and beyond the dermatologist's therapeutic skill. Some of the milder types of anomalies can at times be helped by the judicious use of remedial agents administered topically and internally Others, such as trichotillomania and traumatic marginal alopecia, can be helped with prophylactic measures or may require the joint efforts of dermatologist, pediatrician and psychologist.

Many of the systemic diseases will demonstrate their constitutional disturbances by clinical changes in the hair and nails. Older clinicians looked upon changes in the hair and nails as indicative of many internal diseases. Thus, for example, pallor of the nails in secondary anemia, pitting of the surface of the nail and hyper keratosis beneath the nail as that of a possible psoriasis, dystrophy and destruction of the nails as common in epidermolysis bullosa, spoon-shaped nails as part of the Plummer Vinson syndrome, and so forth. The child with the "syphilitic wig" and luetic alopecia are well known.

In general disorders of the hair and nails are less amenable to the use of topical remedial agents and internal medication than are dermatoses occurring on the glabrous skin. A possible explanation is the highly keratinized structure of the nails, through which penetration and consequent absorption is therefore slower and less effective than through the skin.

ALOPECIA

Alopecia may be partial or complete, patchy congenital or acquired. It can be divided into two main types, cicatricial and noncicatricial, but for ease of reference it is discussed here under the headings Congenital Alopecia, Toxic Alopecia, Alopecia Areata, Alopecia Limitaris Frontalis, Alopecia Cicatrisata and Folliculitis Decalvans.

Most cases seen in children are those in which a circumscribed, noninflammatory loss of hair occurs quite suddenly or is noticed to appear over a period of weeks as smooth, shiny circumscribed areas of patchy baldness. Although it is alarming to the children's mothers, it is my experience that this type of alopecia often improves without the use of topical re

are kept soft and macerated by sweat. Soft corns *may be removed by excision under procaine* anesthesia.

Callosities consist of diffuse *hyperkeratotic* plaques and are commonly seen on the palms and on the feet, especially over bony prominences. A callus differs from a corn in that there is no central core and it is larger in area. Management consists in removing the source of irritation and friction. Orthopedic care is advised *so that proper footwear may replace tight fitting* and improper shoes Soaking the feet in a *solution of sodium thiosulfate will help to soften* the callosity and a strong salicylic acid ointment may then be applied

℞
Salicylic acid 10-15% 12.0-18.0 Gm.
Hydrous wool fat
Petrolatum aa q.s. ad 170.0 Gm.
Misce et fiat unguentum
Signa Apply before retiring

Roentgen therapy is not advised for children

Cutaneous Horns

Cutaneous horns are elongated epidermal growths composed of corneus material and originating from a circumscribed area of the skin (Sutton and Sutton) The cause is unknown al*though it is believed by some that they have* their origin in warts and by others that they begin as sebaceous cysts. *Although no age is ex*empt the condition is rare in infancy

The most frequently encountered is the filiform horn, which resembles a wooden peg. It usually occurs on the face where it slowly grows out from the surface Other types are the papillomatous horn and the verrucous horn both of *which are encased in layers of horny epithelium* A fourth type arises from the bowl of an open atheroma and a fifth type, frequently multiple arises from a nevus.

Large cutaneous horns may resemble the horns of lower animals *In contrast to the latter* however they are not attached to the bony *structure They vary in shape and size and may* be conical cylindrical or straight outgrowths from the skin or they may be turned and twisted upon themselves, even angular Usually they are single and they vary in hue from yellowish to brownish or blackish to yellowish brown Their most common sites are the scalp and face but occasionally they are seen on the penis and scrotum and on the extremities. They are painless.

Cutaneous horns are usually unaccompanied *by inflammatory changes although pyodermic* infection at the base of the lesion may occur following trauma They are persistent but sometimes disappear spontaneously and do not recur They have been known to recur after being knocked off

Wide surgical incision is the simplest, easiest and best method of treatment Smaller types may be pulled out and the base cauterized either *with acid nitrate of mercury or with trichlor*acetic acid. Smaller types may also be removed by fulguration or the cutting current

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Fig. 180.—A, alopecia areata in boy 11 years of age. The skin affected is as smooth as billiard ball. Regrowth occurred after several months without therapy. B alopecia areata. Note the smooth, clean, billiard-ball appearance of the scalp in the areas of hair loss. (Courtesy of Dr. Meyer L. Niedelman.)



Fig. 181.—Alopecia totalis of nearly four years duration in boy 4 years of age. The eyebrows and eyelashes were lost at the age of 1 year but regrew.

medial agents. On the other hand, inflammatory disturbances of the scalp that are accompanied or followed by destruction of the hair follicles results in a permanent alopecia (scar formation)

Congenital Alopecia

The rare congenital alopecia is due to the lack of development of hair follicles. The clinical picture may be of an ectodermal defect either partial or complete The condition may be associated with other congenital defects such as absence of teeth or nails or the presence of cataracts strabismus or syndactylism Consanguinity has been known to exist in a number of affected families. There may be defective development and arrangement of the teeth with early decay Defective secretions, as of sweat and tears, the inability to smell and taste, and disturbances of speech also may occur Feeble mindedness, behavior problems and neurologic disorders have been reported in some families.

Toxic Alopecia

Toxic alopecia follows a severe illness accompanied by fever Thallium at one time employed for the treatment per os of tinea capitis, is another cause and the use of sulfa drugs and penicillin is still another

Alopecia Areata

(Alopecia Circumscripta, Pelade)

Alopecia areata is a disease characterized by circumscribed round or oval patches of noninflammatory loss of hair usually but not invariably limited to the scalp The exact cause is unknown. It may appear at any age in either sex and may involve the scalp eyebrows or bearded region *It has been postulated variously* that in etiology it is neurogenic (psychogenic or organic neurologic) endocrinologic toxic and due to local or general infections including syphilis. It is also believed to be caused by shock or fright, emotional stress and anxiety and eyestrain. A case has been reported in a girl of 13 who temporarily lost her hair 13 days after being raped. It has been theorized that the autonomic nervous system by causing vasoconstriction of the blood supply to the hair follicles, causes the hair to fall out.

Although the scalp is most commonly affected other hairy areas of the body including the eyebrows eyelashes and axillae may be the seat of the disorder The condition appears spontaneously often suddenly and frequently it is *discovered accidentally* The area consists of either round or oval patches with sharply defined margins varying in size from a dime to a silver dollar or larger (Fig 180 *A*) A single area may exist, but usually there are several (Fig. 180 *B*) located on the vertex or on one or both sides of the scalp Upon close examination they are found to be smooth and noninflammatory and of a whitish or pinkish color After remaining stationary for a while the patch of alopecia spreads peripherally During the spreading stage, the hairs at the border of the patch appear to be loose and fragile and they are frequently found broken off near the surface of the scalp. The hairs in this area can easily be epilated, those at the periphery are normal. The atrophic hair at the margin of the patch has been likened in appearance to an exclamation point. By coalescence several bald areas may become confluent to form a large area of baldness. When the entire scalp has become free of hair the condition is spoken of as alopecia totalis (Fig. 181)

Diagnosis.—The sudden appearance of one or more areas of baldness varying in size from a dime to a silver dollar or larger should suggest alopecia areata The area of skin affected is smooth whitish noninflammatory and noncicatricial The borders of the patch generally show "exclamation point" hair These signs and the history will aid in differentiating the condition from tinea capitis, favus, lupus erythematosus, x ray alopecia traumatic alopecia syphilitic alopecia trichotillomania folliculitis decalvans and acute local infectious processes. Wood light examination microscopic examination and culture may be necessary in some instances.

Complications and Prognosis.—Complications will depend on the cause. In children with a permanent loss of hair psychic trauma resulting in an inferiority complex and isolation from playmates may become a real problem to parents and pediatrician. In general however the prognosis in children is good. The noncicatricial alopecias ordinarily improve with re-

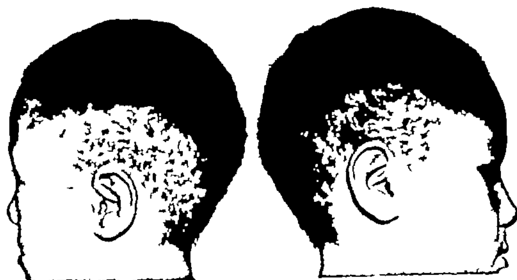


Fig. 182.—Alopecia liminaris frontalis in girl 5 years of age. Note the symmetrical, marginated loss of hair caused by tight braiding and the associated seborrheic dermatitis.

in later childhood the condition is more commonly met with in adults. It is due to tight braids, which cause tugging of the hair that traumatizes the hair and causes them to break off. When traction on the hairs is relieved a normal regrowth of hairs occurs in areas that have not undergone scarring.

Alopecia Cicatrisata

(Pseudopelade of Brocq)

Alopecia cicatrisata is characterized by circular, oval, or irregular and variously sized patches of alopecia, associated with atrophy of the skin in the areas. It is unaccompanied by subjective sensations and it terminates in permanent baldness. The cause is unknown. The condition usually affects adults, although the disease is occasionally seen in infants and children.

The disease begins insidiously as tiny pinhead lesions which enlarge to the size of a dime or silver dollar and even larger. The bald spots are circular, oval or irregularly shaped, of bluish or pinkish color. Later the lesions look shiny and are atrophic. By coalescence several of the smaller or medium-sized lesions form large plaques. Any part of the scalp may be affected, although the vertex is the usual site. The denuded areas of the scalp are thin and atrophic with a glistening white skin resembling a layer of onion skin. Close inspection will disclose the presence of epidermic cones plugging the outlets of the hair follicles. As the condition progresses, the skin of the affected areas undergoes further atrophy which eventually terminates in a definite scar. The alopecia does not involve the entire scalp. There are no subjective symptoms.

The condition can be differentiated from *alopecia areata, favus, lupus erythematosus, syphilis* and *folliculitis decalvans* by the clinical picture already described and the absence of characteristics typical of these diseases, as well as by appropriate laboratory examinations.

Seborrhea is a common complication and nail changes may occur.

The condition may continue for several months and then become stationary. The alopecia is never complete. The disease is incurable and children may develop an inferiority sense because of the permanent absence of hair.

There are no specific remedies. A thorough physical examination should be carried out in a search for foci of infection. A well-balanced diet with special attention to vitamins is indicated and adequate rest and sleep and exercise in the open also are important.

The topical therapy is similar to that for alo-

growth of hair appearing as a rule after three months or a year However relapses may occur before the hair is restored to normal. Some dermatologists believe that alopecia areata is much more severe when it begins before puberty

Treatment.—Since it is not always possible to discover the cause for alopecia areata treatment must necessarily be empirical The first step in management is a complete physical examination Foci of infection should be sought and eradicated. The eyes ears teeth nose and throat should be carefully examined and any defects corrected. Physical examination should include search for endocrine disturbances or vitamin deficiencies. Nervous syndromes should be looked for and special attention should be paid to the skin, nails teeth, tongue and hair distribution Laboratory tests should include urinalysis, basal metabolism blood sugar and cholesterol determinations and microscopic examination of the hair and scalp for fungus parasites and other organisms. A Wood light examination should be made in a search for fungi

The most useful therapy appears to be some form of local stimulation with the aim of producing a hyperemia of the scalp This is accomplished either by means of chemical agents applied topically to the scalp or through the use of ultraviolet light (mercury quartz lamp)

Topical application of phenol has found favor among many dermatologists The bald patch is painted with 96 per cent liquefied phenol the effects of which are immediately neutralized by 95 per cent alcohol. Some prefer to use undiluted phenol with neutralization by alcohol as soon as or just before blanching appears. This application is alternated weekly with suberythema doses of ultraviolet radiation from a mercury vapor quartz burner The treatment with phenol may be carried out once a week Massage also is of value in bringing about a hyperemia

I have employed topical applications of coal tar solution nightly applied by means of a cotton applicator to the bald areas of the scalp and followed by sub-erythema doses of ultraviolet light. This method has brought apparently good results in causing a regrowth of hair in many of the so-called "functional" alopecias in children It is true that it is hard to say whether regrowth of hair might have occurred in many instances without such treatment nevertheless the treatment is worthwhile if only from the psychologic point of view The use of high frequency electricity and irritating ointments such as 1 3 per cent chrysarobin and 5 10 per cent ammoniated mercury ointment or painting the lesions with 1 per cent tincture of iodine once or twice weekly are other methods that have been used for their counterirritant effect.

ACTH has been employed administered intramuscularly in divided doses of 40-60 mg. daily with encouraging results although without permanent benefit. Cortisone acetate also has been tried with similar results It would appear however that their use is on the whole in the experimental stage.

Representative Prescriptions

℞

Chloral hydrate	4 0
Salicylic Acid	4 0
Bichloride of mercury	0.2
Glycerin	8.0
Alcohol (70%) q.s. ad	120 0

Misce et fiat lotio

Signa Apply with gentle massage to bald areas before bedtime

℞

Salicylic acid	8 0
Resorcin	4 0
Zinc sulfocarbolate	15.0
Coal tar solution	15.0
Glycerin	15 0
Alcohol	
Distilled Water aa q.s. ad	40 0

Misce et fiat lotio

Signa Apply to bald area with gentle massage before retiring

Should be omitted in blondes.

Alopecia Liminaris Frontalis

(Traumatic Marginal Alopecia)

Alopecia liminaris frontalis is the result of hair loss about the margins of the scalp. It is characterized by the falling out of the hair beginning in front of the ears and then spreading to the forehead. The condition is symmetrical and appears in a line-like marginated fashion (Fig. 182) The hair of the remainder of the scalp remains normal Frequently a mild seborrheic dermatitis characterized by crusts precedes the alopecia The resulting alopecia is permanent and is followed by numerous small scars which may be difficult to detect Although seen

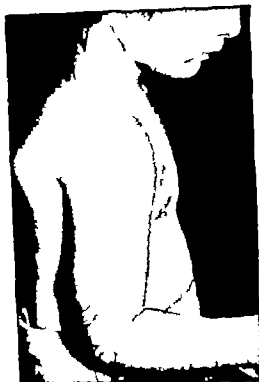


Fig. 183.—Hypertrichosis in girl 4 years of age. It appeared mostly on the upper and lower extremities. A sister also had hypertrichosis.

lumbar or sacral region, sometimes in association with spina bifida. Birthmarks also are sometimes tufted with hair. Patches of hypertrichosis may be found on any part of the body even on the face, associated with other abnormalities.

Precocious growth of hair over the pubic region and elsewhere, occurring before puberty in either sex, calls for complete physical examination and other studies to rule out the possibility of endocrinologic conditions and tumors of the adrenals, pituitary gland, ovaries and testes.

The management of *acquired hypertrichosis* includes the use of bleaching agents such as peroxide of hydrogen. Temporary removal may be accomplished by means of a pumice stone, a depilatory containing calcium, sulfide, epilating waxes and by shaving. Permanent removal can be effected by epilation with the high frequency current, the galvanic current or the terminal current of surgical diathermy. Such treatment should be entrusted only to one who has had special training in the use of those modalities, for scarring has been known to follow improper application. X-ray epilation is mentioned only to be condemned.

POLIOSIS (Canities)

The term "poliosis" is derived from the Greek root meaning gray. It is used to describe areas of localized depigmentation of the hair in contrast to the term canities, which describes gray graying or whitening of the hair of the entire scalp. There are two types, congenital and acquired.

Poliosis represents a dominant trait. Among predisposing factors are extreme psychotic and psychotic-neurotic states and cerebral trauma.

pecia areata (p 430) Frequent shampooing of the scalp and the use of *stimulating remedies* such as liquor carbonis detergens together with sub-erythema doses of ultraviolet light from a mercury vapor air-cooled lamp are beneficial

Folliculitis Decalvans

This rare disease is characterized by a progressive inflammatory reaction of the scalp with marginal papules pustules and crusts terminating in scar formation The disease is chronic and the alopecia permanent It is occasionally seen in children

It is probably caused by micro-organisms. The staphylococcus aureus has been recovered by independent investigators from a culture of the diseased hairs.

Clinical Picture.—Initially a small or a number of small pinhead sized inflammatory papules appear which often pass unnoticed Or pustules may be seen surrounding the follicular orifices. When the condition is not discovered until it is far advanced then, after many years an alopecia with scarring is among the first signs observed The disorder is progressive one follicle after another becoming affected as the disease moves through periods of activity and quiescence During the height of the disease the advancing margin of the plaque of alopecia is characterized by the appearance of papules pustules and crusts. Any area of the scalp may be affected but the vertex is the most commonly involved Both the areas of alopecia and scarring may vary in size from a split pea to a silver dollar and sometimes larger

Diagnosis.—The essential feature in diagnosis is the central healing (permanent alopecia with scar tissue) surrounded by still active lesions, papules pustules and crusts at the margin of the plaque The marginal inflammation will help in differentiation from *alopecia areata lupus erythematosus* and except in the end stages, from *pseudopelade* The history the absence of other concomitants of the diseases together with histopathologic study will aid in differentiation from scars following trauma such as occur in certain *syphilids* and atrophic forms of *lichen planus*

Prognosis.—The disease is essentially chronic and progressive but it terminates spontaneously after many years.

Treatment.—An attempt should be made to check progress of the disease by the topical use of parasiticidal remedies and by improving the patient s general resistance A complete examination should be made and when a focus of infection is discovered it should be removed if possible. Special attention should be directed to a well balanced diet containing adequate vitamins sufficient rest and play in the open with an abundance of sunshine Antibiotics also should be tried. Autogenous vaccine also is worth a trial

Topical therapy consists in the use of antiseptic wet dressings ointments and creams. The affected hairs should be epilated manually Bichloride of mercury 1 5 000 in alcohol may be used as a wet dressing, or dalibour water diluted in proportion of 1 20 or 1 30 Burow's solution, 1 10 or 1 20 or Vlemingkx s lotion, one tablespoonful added to a pint or a quart of hot water applied several times daily Vioform, 3 per cent in petrolatum or a combination of salicylic acid and precipitated sulfur of each 3 per cent, in a lanolin petrolatum base also is worth a trial. Topical antibiotic therapy by Bacitracin or Neosporin ointment may be tried. Some cases respond to carbon dioxide slush others do well with ultraviolet therapy administered with a Kromayer lamp

Streptomycin has been used successfully injected into the active border of the lesion by means of a hypo-spray and may well be worth a trial

See Formulary ℞ 6, 42, 43 47 parasiticidal remedies.

HYPERTRICHOSIS (Hirsutism)

Hypertrichosis consists of a superabundance of hair usually on the upper (Fig 183) and lower extremities. In most cases it was present at birth but it may appear during early childhood or later in life Thus it may be congenital or acquired.

The *congenital* type may be localized or diffuse Localized hirsute areas may be seen in the

ably carbon dioxide) which, clouding the outer layer of the cortex, covers the pigment.

Pili torti (twisted hairs) is an uncommon, congenital, familial malformation of the hair characterized by twisting of the hair shaft on its axis. It occurs mostly in the occipital area of the scalp. Clinically the hairs appear dry fuzzy and brittle. There may be an associated partial baldness of the scalp.

Trichocryptomania (from the Greek words for hair secret and madness) is an alopecia of the scalp due to rubbing the hair out by friction. The condition, usually located in the occipital area of the scalp is frequently to be construed as an early sign of rickets. When this is the case it clears up with antirachitic therapy

Trichonodosis (from the Latin words for hair and knot) or spontaneous knotting of the hairs, is a variant of the normal hair structure that gives the hair shaft nodular appearance. Actually the nodules are true knots or loops, usually situated on the peripheral half of the hair shaft. The condition probably results from an inability of new hairs to grow freely from the follicles because of more than normal toughness of the surrounding tissues.

Trichoptilosis (from the Greek words for hair and down) is a splitting of the hair into numerous fine filaments like those of a feather

Trichorrhexis nodosa (from Greek words for hair and flowing and the Latin for knotted) is an atrophic condition of the hair characterized by irregular thickenings of the hair shaft that resemble nodes. The hair frays and fractures easily Fringed hairs not unlike those of a hair brush may be seen on microscopic examination.

Trichostasis spinulosa (from the Greek words for hair and condition and the Latin for full of spines) is a peculiar disorder of the hair follicles characterized by numerous black, elevated, keratin-like plugs which fill the outlets of the hair follicles. Under the microscope such lesions are found to be composed of bundles of lanugo hairs. The condition is found on the shoulders and back and the nape of the neck near the margin of the scalp.

Trichotillomania (from Greek words for hair pluck and madness) is alopecia caused by an uncontrollable impulse to pull out the hair The condition sometimes simulates tinea capitis but on close examination the broken-off hair stumps characteristic of ringworm of the scalp will not be found and examination by a Wood light will fail to disclose the green fluorescent hairs characteristic of infection with the microspora. Mycologic examination of the hairs or culture will also reveal no fungus.

The loss of hair generally occurs in the




Fig. 185.—Monilethrix in young boy Note the sparseness of the scalp hairs. The hairs are unusually short because of fracture Considerable scaliness of the scalp (pityriasis capitis) can be seen. Keratosis pilaris is often associated with the dermatosis, which is considered to be congenital and hereditary disease At the right, the photomicrograph of hairs from the same boy shows the constrictions along the shafts which give the hair beaded appearance. (Courtesy of Dr Donald N Tschen.)



Fig 184 —Poliosis in a boy 10 years of age. Note the patch of depigmented hair on the left frontal and temple areas in A The right-hand photograph in B shows the microscopic appearance of one of the hairs for comparison with the normal hair at the left (By permission from Gilman, R. L., and Perlman, H H J Pediat. 40 101 1952.)

Heredity emotional strain endocrine disturbances, dietary deficiency and chronic diseases *such as tuberculosis, syphilis, malaria, diabetes,* Addison's disease and Simmonds disease are considered to be some of the possible predisposing factors.

Usually the depigmented hairs occur in a single patch (Fig. 184 *A*) Microscopic examination will disclose the affected hair to be translucent and devoid of pigment (Fig. 184 *B*) The *condition is permanent.* The use of chemicals and dyes to overcome the depigmentation is to be condemned Systemic therapy with pantothenic acid *in my experience has caused no im*provement others have reported satisfactory results.

OTHER DISORDERS OF THE HAIR

Monilethrix (from Latin words for neck lace" and the Greek word for "hair) also known as "beaded hair is a congenital ectodermal defect, frequently hereditary characterized by a dryness and fragility of the hairs of the scalp (Fig 185) Nodes occurring regularly or irregularly along the hair shaft give a beaded appearance. The hair is liable to fracture at its thin points. An associated keratosis pilaris is *usually found* on the posterior region of the neck and on the extensor surfaces of the upper extremities There is no treatment.

Pili annulati (leucotrichia annularis, thrix annulati or "ringed hair") is a peculiar condition of the hair shaft in which spindle-shaped white zones alternate with normally pigmented ones. When the hair shaft is viewed in reflected light such hairs exhibit alternating narrow almost ringlike pigmented and white bands. This phenomenon is believed to be due to a gas (prob-

shaped nails demonstrating a shallow concavity not unlike that of a spoon occurs as part of the Plummer Vinson syndrome (microcytic anemia, glossitis and dysphagia) and also is seen in nutritive diseases accompanied by loss of weight and in acanthosis nigricans.

Leukonychia (from Greek leukos, white and onyx, nail) —White nails appear in millet to pinhead sized streaks and white spots, beginning first in the lunula and gradually extending distally to the edge of the nail. It is frequently seen in children apparently in good health. Transverse white lines beginning at the proximal end of the nail and extending distally as the nail grows outward are referred to as Mees' lines. Trauma undoubtedly plays part in their production. However they are seen also in many systemic diseases, in atopic dermatitis and in psoriasis and following the ingestion of heavy toxic metal.

Onychauxis (from Greek onyx, nail and auxesis, increase or growth) —A distortion or hypertrophy of the nails is caused by a hyperkeratosis of the nail bed. Such nails not only lose their normal lustre but become hard, dry and brittle so that the nail may actually be lifted up and away from its bed particularly at the distal free end. This condition is associated with other anomalies affecting the hair and with psoriasis.

Onychitis —Inflammation of the folds or matrix of the nail is not infrequently caused by pyogenic organisms and fungi.

Onychomadesis (from Greek onyx, nail and madesis, shedding) —Shedding of the nails is seen following severe infections such as scarlet fever also in constitutional diseases such as syphilis and diabetes. It is a frequent sign of mycotic infection and is occasionally seen in child subjects of alopecia areata.

Onychorrhexis (from Greek onyx, nail and rhexis, breaking) —The longitudinal splitting of the nails is seen in vitamin B deficiency and also as the result of many extrinsic factors such as the use of alkalies.

Onychoschizia (from Greek schizein, to cleave and onyx, nail) —The loosening of the nail from its bed occurs in diseases such as atopic dermatitis and psoriasis. It is caused by an accumulation of dried exudate and debris resulting from an underlying pathologic process.

Pachyonychia Congenita (from Greek pachys, thick and Latin congenitus, by birth) —The nails appear dystrophic, deformed and hyperkeratotic. It is also seen in congenital syphilis, ichthyosis hystrix, congenital ectoder

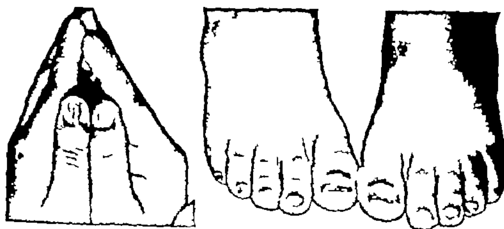


Fig. 187 —Dystrophia mediana canaliformis in a boy 5½ years of age in whom the condition had been present since the age of 2 years. Note the large central longitudinal ridge on the left thumbnail and several small longitudinal ridges on the right thumbnail. The mother stated that all the other nails had been similarly affected but had cleared up. Note that several of the toenails are dystrophic. No other member of the family was affected. Negative results from blood serologic test and culture for fungi.




Fig 186 —Trichotillomania. In both children note the irregular areas of baldness caused by pulling out of the hairs (*Right* courtesy of Dr John C Belisario Photography by Mr Woodward Smith, Department of Artistry University of Sydney)

frontal region although the sides of the scalp also may be involved (Fig. 186) Frequently tufts of hair are found under the pillow The treatment of choice is a hair-cut so close as to prevent the child from grasping the hairs and pulling. Neurologic habit and emotional disturbances underlying the condition often require the advice and care of a psychologist.

DISORDERS OF THE NAILS

The nails, like the skin hair and teeth, are of ectodermal origin Accordingly many of the systemic diseases affecting the skin have their counterpart in the nails and affect their nutrition growth and proper development. Frequently a gross examination of the nails can provide a clue to constitutional disorders and disturbances.

Anonychia (from Greek an not and onyx nail) —The absence of nails is seldom encountered in children When found it is usually congenital. It is seen also in ichthyosis gravis (harlequin fetus)

Beau's Lines —Transverse furrows begin near the lunula and extend outward with growth of the nail until finally they appear at the edge They are commonly found in healthy young children as well as in the anemic and malnourished. They are seen in many acute infectious diseases and the common systemic disturbances.

Brittleness of the Nails —Commonly observed in children this condition is apparently a concomitant of many of the nutritional disturbances and of secondary anemia atopic dermatitis lichen planus psoriasis congenital syphilis, hyperthyroidism and hypothyroidism.

Clubbing of the Nails —Clubbing of the fingernails and toenails may be seen in congenital heart disease in subacute bacterial endocarditis and in chronic pulmonary diseases.

Dystrophia Mediana Canaliformis (from Greek dystrophia difficult nourishment and Latin medius, middle and canaliformis, canal-formed) —The nail may actually split longitudinally The condition is not common. It is characterized by a central, longitudinal dark brown, herring bone shaped fissure of the nail extending distally from the base to the free edge Usually it affects the thumbnails (Fig 187) although other nails also may share in the process. Trauma is generally a factor in its production.

Hapalonychia (from Greek hapalos, soft and onyx " nail) —This condition involving a splitting of the nails is frequently seen following the use of strong alkalies such as household ammonia

Koilonychia (from Greek "koilos, hollow and onyx nail) —The condition of spoon-

shaped nails demonstrating a shallow concavity not unlike that of a spoon occurs as part of the Plummer Vinson syndrome (microcytic anemia, glossitis and dysphagia) and also is seen in nutritive diseases accompanied by loss of weight and in acanthosis nigricans.

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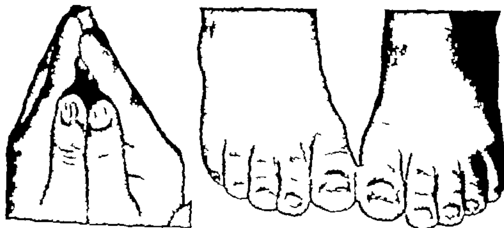


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mal dysplasia and epidermolysis bullosa. At times it is found in plantar and palmar hyperkeratosis.

Paronychia (from Greek "para" beside or along and "onyx," nail) —Pyogenic infection is due to streptococci or staphylococci. The resulting pyoderma may be localized to the nail folds and not infrequently appears at the sides and base of the nail.

Racket Nail or Micronychia (from Greek "mikros," small and "onyx" nail) —Racket nail a variety of micronychia is seen on the thumbnail and may occur on one or on both. It is characterized by a shortening in the length of the nail and a slight increase in its breadth.

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29

Disorders of the Sweat Apparatus & Sebaceous Glands

IN THIS CHAPTER are discussed disturbances in the amount or character of perspiration (hyperhidrosis, dyshidrosis, granulosis rubra nasi, anhidrosis, bromhidrosis) and disorders of sweat glands, the sebaceous glands and their ducts (miliaria rubra, sebaceous cysts, milium and acne vulgaris)

Hyperhidrosis

Hyperhidrosis is a condition characterized by excessive sweating. It may be localized to the hands and feet or be more or less generalized. A poorly balanced sympathetic nervous system probably accounts for most instances. Reflex causes and emotional disturbances, fright, worry (e g about flunking an examination) and similar factors may precipitate an attack of sweating. Organic disease such as tuberculosis and infections and the use of antihistaminic therapy are other causes. Although sweating may be localized to one half of the trunk or face (hemihyperhidrosis) the type usually seen in children is localized to the hands, feet and axillae. Frequently the hands and feet are cold, clammy and even cyanotic (indicating vasomotor disturbance)

Management consists in careful physical examination to rule out the possibility of organic disease. In the functional type, mild astringents such as aluminum potassium sulfate (1 tablespoonful dissolved in 2 qt. of hot water and cooled) may be employed as a sponge bath or soak. Aluminum chloride, in 5 per cent strength dissolved in water may be used similarly Glycerite of tannic acid, 1 oz. to 1 qt. of water or zinc sulfate, 3 per cent solution, to which may be added ½ oz. of alcohol, are other useful topical remedial agents. A mild dusting powder of unscented talc may be applied after sponging or soak. For hyperhidrosis of the feet, white cotton socks should be worn and changed frequently during the day

Sedation in the form of antihistaminics and barbiturates is at times of value in decreasing nervous irritability and nervous tension. Roentgen therapy is probably not indicated for hyperhidrosis in children. When found necessary it should be administered by a dermatologist skilled in such therapy

Dyshidrosis

Dyshidrosis is characterized by a vesicular eruption localized on the hands, feet or both (Fig. 188) Crops of deep seated vesicles varying in size from pinhead to millet seed and sometimes larger are located usually on the palms and soles and the lateral aspects of the fingers. The exact cause is unknown although an unstable vasomotor system has frequently been said to be responsible. Management con-

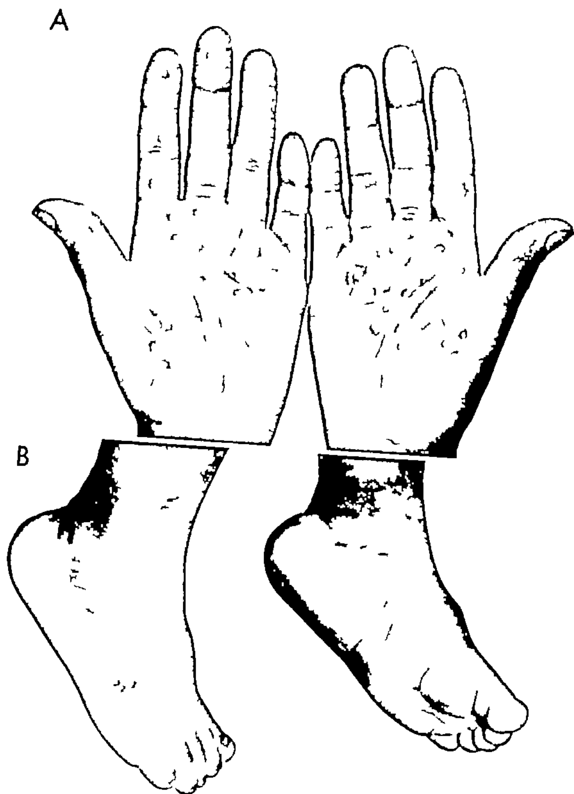


Fig. 188.—Dyshidrosis, A, of several years duration in a girl 8 years of age and B of one year's duration in a boy 2 years of age. In both children the lesions were present on both hands and feet and there was a history of excessive sweating. Note the deeply seated vesicles.

ents in the use of wet dressings such as aluminum acetate solution 1 10 simple shake lotions such as calamine lotion, Burow's emulsion or the simple Lassar's zinc oxide paste.

Granulosis Rubra Nasi

This condition is seen infrequently in children. The exact etiology is unknown. It has been seen in impoverished children from infancy to puberty when it usually disappears. The lesions are limited to the nose and are characterized by erythema and by pinhead sized reddish brown papules, vesicles, pustules and crusts. Droplets of sweat appear over the surface of the nose which when wiped off quickly recur There are no complications. Management consists in attention to the general health and the use of hematinics when secondary anemia is present. Good results have followed the use of riboflavin in some instances.

Anhidrosis (Hypohidrosis)

Anhidrosis is a condition characterized by decreased sweat. It may be due to congenital absence of the eccrine glands. It is sometimes found with congenital ectodermal dysplasia and it occurs in myxedema, atopic dermatitis, ichthyosis, hyperthyroidism and scleroderma.

Bromhidrosis

Bromhidrosis, or malodorous sweating, is commonly seen on the feet, in the genitocrural regions and on the axillae. It may be localized or associated with generalized sweating. It is commonly found to occur at puberty when the apocrine glands are quite active.

Soaks of potassium permanganate or zinc permanganate (1 70 000) are serviceable in management. Parasympatholytic agents (anticholinergic drugs) such as methscopolamine bromide and Banthine bromide, in my experience have not been very helpful because of side effects.

Miliaria Rubra

(Prickly Heat)

Miliaria rubra is a mild inflammatory infection due to an engorgement of the sweat glands and obstruction of their outlets. Small papules and vesicles are seen at the outlets of the sweat ducts. Sudamina or miliaria crystallina is prickly heat in which the lesions are small vesicles in contrast to the usual picture, this variant is noninflammatory

Although miliaria rubra is a hot weather condition, some of the most severe cases seen in practice occur in winter arising from over heated rooms, the wearing of excessive clothing or both.

Clinical Picture.—The eruption appears suddenly after excessive perspiration. Infants evidence their discomfort by crying older children complain of a burning sensation and itching. It consists of innumerable discrete, closely packed, pinhead-sized, red papules surrounded by a small erythematous zone (Fig. 189) Vesicopapules may be present. At times there may be a wide area of redness. Although any part of the skin may be affected, the areas of predilection are those covered by clothing. The chest and back, the arms and frequently the scalp are affected. Under favorable conditions, the lesions dry up with a slight desquamation following.

Diagnosis.—Ordinarily the diagnosis is simple, being based on the clinical picture already described. The mother complains that the infant or child sweats profusely H is usually overclothed, covered by many blankets or in a room of which the temperature is unusually high, humid and uncomfortable.

Differential Diagnosis.—Sudamina may be confused with vesicular eczema (or milliaria rubra with papular eczema) or chickenpox. The distinguishing factors are the edema which invariably occurs at some time in *eczema* and the distribution, which in the latter is usually upon the antecubital and popliteal areas. Miliaria rubra can be differentiated from *lichen urticatus* by the fact that in the latter there are vesiculopapular pruritic lesions on the extensor surfaces of the upper and lower extremities. The character and distribution of the lesions will serve to rule out *chickenpox* in which the eruption is polymorphous, the lesions are not tightly packed and may be found in the mouth and scalp and there may be a history of exposure.

Prognosis and Complications.—The eruption

usually disappears after a few days although it may last for several weeks. It may be complicated by impetigo intertrigo small pustules and abscesses and periporitis staphylogenes.

Prophylaxis and Treatment—Prickly heat resulting from overheated rooms and excessive clothing can be prevented simply by correcting these conditions. In summer the infant should receive frequent cooling baths or starch baths. In winter he should not be overclothed. Unfortunately the wrong notion still prevails among the underprivileged that the infant must be kept surrounded with several layers of underclothes and covered with blankets lest it take cold.

The room where the child is kept should be well ventilated and properly heated, but not overheated. A good temperature one that can easily be raised or lowered is 70 F During the hot season the child should never be placed in the direct rays of the sun for prolonged periods. In the summer cotton underwear is proper For all other seasons including the late fall, winter and early spring, heavier cotton may be used. It may be taken as a rule that if a normal healthy infant perspires excessively while showing no other unusual signs, he is overclothed.

During very hot days, the infant should be sponged with cool water several times daily and left to kick about with the extremities free and unprotected covered only with a diaper Witch hazel water because it contains a small amount of alcohol makes an excellent evaporating lotion and should be used as a sponge for infants several times daily For the older child, witch hazel water may be combined with an equal amount of a saturated solution of boric acid on drying after the bath, a dusting powder of cornstarch or an unscented talc may be used

In the treatment of miliaria rubra ointments, because they generate heat and macerate the skin, should be avoided. Antiphlogistics include starch kaolin and oatmeal baths Aveeno has been found satisfactory The use of alkaline soap



Fig. 189.—Miliaria rubra in an infant. Note the innumerable vesicles and papules surrounded by erythema

is contraindicated. After the bath an unscented talc may be dusted on the skin.

Simple shake lotions and evaporating lotions should be prescribed. The following shake lotion is an example

℞

Zinc Oxide	30 0
Purified talc	30 0
Bentonite	4 0
Hamamelis water	30 0
Calcium hydroxide solution q s. ad	180.0

Misce et fiat lotio

Signa: Apply freely Follow by dusting powder (unscented talc.)

Indication. Soothing Mildly astringent

(One half to one per cent of mercuric sulfide (cinnabar) may be added to the prescription for its antibacterial effect if desired.)

Representative Prescription

℞

Tannic acid (1 2%)	0-10 0
Alcohol U.S.P (20%) vel	
Distilled water q s. ad	500 0

Misce et fiat lotio

Signa: Apply freely

Indication Prophylaxis and active therapy in miliaria rubra

See Formulary ℞ 4 for soothing prophylactic and bactericidal lotion 5 for mildly astringent protective lotion, 77 for soothing, mildly astringent remedy 76, for antiphlogistic

Sebaceous Cyst

(Steatoma)

This condition is characterized by the appearance of one or more smooth, round, globular tumors of a somewhat soft or firm consistency They are elevated considerably above the surface of the skin and are felt in and beneath the skin surface. They vary in size from small pea to good sized nut and in color are that of normal skin or perhaps of pinkish, bluish or purplish hue. Common locations include the scalp, forehead, behind the ears (Fig. 190) the trunk and the genitalia. Usually a cheesy substance may be expressed from the centers of the lesions which mark the outlets of the sebaceous ducts. Or the cyst may be entirely without a patulous duct. The cause is unknown. Sebaceous cysts are frequently found to be associated with lesions of acne vulgaris during adolescence and are believed to be produced by a plugging of the outlet of the sebaceous duct much in the same manner as occurs with a comedo. Sebaceous cysts are differentiated from *lipomas* by the fact that the latter are softer in consistency and are also characterized by lobulation. *Chalazions* are small tumors which develop on the eyelids from Meibomian glands and are the equivalent to sebaceous cysts.

The management of sebaceous cysts consists



Fig 190 —Sebaceous cyst behind the left ear boy 11 years of age.

in excision, with care to see that the entire sac is removed. The interior of the sac may then be painted with 1 per cent tincture of iodine.

Milium

Milia are retention cysts caused by the occlusion of pilosebaceous follicles. They are expressions of the retention beneath the epidermis of material from occluded normal or rudimentary sebaceous glands. They are frequently encountered in the newborn infant about the lids and temples. Milia are seen in epidermolysis bullosa, congenital ectodermal defect, tuberculosis and syphilis. They may be produced mechanically

The lesions appear as single or numerous white, yellowish-white, sharply circumscribed

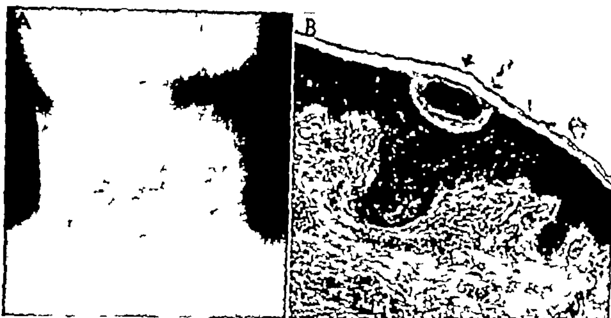


Fig 191 —Milium in a schoolboy In A note the miniature white cystic excrescences on the chin. Others appeared on the upper and lower eyelids and on the nose. This patient also had Darier's disease (Fig. 159) B shows the classical histopathologic picture of an epidermal cyst in milium. The cysts are in reality retention cysts and are caused by plugging of a pilosebaceous follicle.

elevations from millet seed to pinhead in size (Fig. 191) They are usually located on the face eyelids, forehead cheeks and temples occasionally elsewhere, as on the penis. Milia may persist for months and are often followed by scaling and disappearance. They do not itch and there are no constitutional symptoms.

Diagnosis is comparatively simple on the basis of the clinical picture already described. The lesions can be differentiated from comedones by the lack of the central blackened plug which characterizes the latter and the fact that milia are superficial to the skin surface in contrast to the deeper situation of comedones. The smaller lesions of *xanthoma* also are situated much deeper in the skin and the lesions are yellow chamois in color Milia can be differentiated from young *molluscum contagiosa* lesions by the lack of central delling in the former and by the inability to extract a cheese-like substance from the lesions

Occasionally milia, undergoing calcium deposition become hard as rock Usually however there are no complications The prognosis is good. In infants spontaneous involution is the rule.

Milium may be prevented by the mechanical scrubbing of the skin with a good grade of pumice-stone soap For treatment of the more superficial lesions, an ointment containing 5 per cent salicylic acid and 10 per cent sulfur in petrolatum may be prescribed, to be applied nightly Electrolysis is another means of removal. Or the vesicle may be ruptured with a Hagedorn needle and its contents expressed with a comedo extractor

Acne Vulgaris

Acne vulgaris is a chronic inflammation of the skin involving the pilosebaceous glands and their ducts It is characterized by the presence of comedones papules, pustules and nodes in various combinations. The skin is often oily or greasy (seborrhea oleosa)

There are five types (1) acne punctata in which the lesions are papular but the comedones are easily seen (2) acne papulosa, characterized by an acute inflammatory reaction (3) acne pustulosa characterized by superficial pustules (4) acne indurata characterized by deep-seated lesions resulting often in disfigurement and

5) cystic acne, characterized by formation of cysts containing pus.

Etiology.—Acne vulgaris occurs most frequently during adolescence. It is one of the most common disorders beginning at puberty occurring in 70-80 per cent of all children. Ordinarily it is anticipated and discounted by most parents, who regard it as a physiologic feature of adolescence.

The etiology is not well understood. It is thought to be due partly to bacteria (acne bacillus and staphylococcus) and partly to endocrine or other constitutional disturbance. Dietetic errors, masturbation, intestinal auto-intoxication, chronic appendicitis, foci of infection, secondary anemia, constipation and insufficient rest all may act as primary or contributory causative factors. Acne becomes exaggerated preceding the menstrual period. Other factors include fatigue, insufficient sleep and lack of exercise. Occasionally a proprietary medicine may be responsible, such as triple bromides, bromo-quinine, and many cold tablets containing bromide. The physician should inquire whether such remedies are being taken per os. *Although iodine is a* possible offender there is no proof that its ingestion in iodized table salt or in deep-sea food is in any way responsible. Chocolate and related products, such as the cola bean so popular in soft drinks, are known bad offenders and should be strictly eliminated in the management. Dandruff is considered by many dermatologists as a possible factor especially in persistent acne. Certainly I have observed that acne frequently clears after the dandruff has improved with proper medication.

Infantile acne (Fig. 192) has been reported by many observers, with the youngest patient an infant one week old. It has been attributed to a hormonal pregnancy reaction and also to extraneous factors. Among these are oils and ointments that occlude the facial glands, *leading* to comedo formation and then to acneform eruptions, the combination of warmth and mois-



Fig. 192.—Acne neonatorum. Note papules and comedones on both cheeks, chin and forehead. (By permission from J Pediat 33 609-613 Nov 1948.)

ture and general constitutional weakness and ill health. Male infants apparently are more often affected than females.

Clinical Picture.—The clinical picture of acne (Fig. 193) is well known. Usually with the onset of puberty the skin of the face and chest becomes greasy and oily and develops papules, pustules and nodules with a surrounding erythematous area. The primary lesion, the comedo (Fig. 194), represents a small amount of sebum from the pilosebaceous gland which has become oxidized and a hyperkeratotic scale which plugs the outlet of the sebaceous duct. Some acne lesions dry up and disappear only to be followed by fresh ones. The lesions may become indurated, cystic (Fig. 195) or complicated by scars and atrophic changes. Secondary infection due to trauma induced by scratching is not uncommon.

Diagnosis.—A diagnosis of acne is based on lesions appearing in adolescence, their distribution on areas of skin richly endowed with sebaceous glands (face, back, shoulders) and upon the associated oily seborrhea which usually is present. The follicular lesions and associated comedones are additional aids in diagnosis.

In differential diagnosis, *bromoderma* can be ruled out by the presence of comedones as well as by the history. The *pustular syphilid* can be ruled out by appropriate laboratory tests and, of course, in syphilis there will be other concomitants of the disease. *Variola* can be ruled out if the patient is not ill, if there is no *history of* exposure to smallpox and if the lesions are polymorphous.

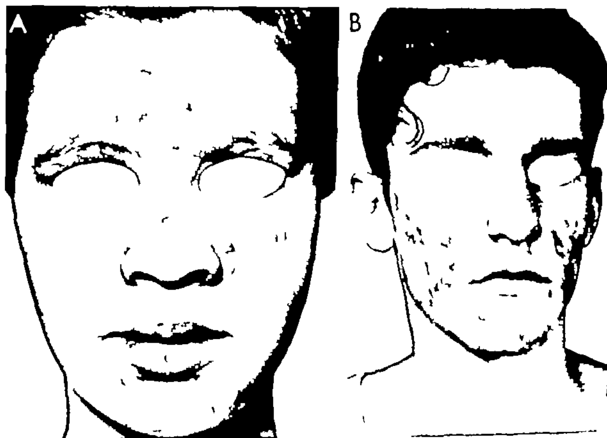


Fig. 193.—Acne vulgaris. A, in a girl 11 years of age. Lesions were first noticed at the age of 10 years. Note the papules, pustules and comedones. B, in a boy 14 years of age. Note the papules, pustules and scars. (*B* courtesy of Dr. John C. Belisario. Photography by Mr. Woodward Smith, Department of Artistry, University of Sydney.)

Complications and Prognosis.—The ordinary mild case of acne clears up completely, the lesions disappearing after puberty. When the facial lesions are numerous and extensive, the average boy or girl becomes self-conscious and



Fig. 194.—Acne vulgaris. A, in boy 12 years of age. Note the seborrheic type of skin and the comedones in the ear B, multiple comedones in boy 10 years of age using hair oil. (*B* courtesy of Dr John C. Belnario. Photography by M Woodward Smith, Department of Artistry University of Sydney)

continued, severe lesions may lead to severe social and personality disturbances. Furthermore because acne sometimes leaves behind unsightly pits and scars it may extend its malign moral influence into the years ahead. (Acne cysts are not infrequently seen in young boys and girls)

Prophylaxis and Treatment.—The objectives in management are to prevent the lesions from reaching that stage where they produce an unsightly and disfiguring appearance, thus avoiding an inferiority complex, and to keep the pilosebaceous outlets patent by proper topical remedial agents. Early treatment is therefore important. It is of further importance to reduce overactivity of the sebaceous glands and to prevent scarring insofar as is possible.

The aim in prophylaxis is to avoid all contributory etiologic factors discussed under etiology In addition (1) secondary anemia should be overcome by the use of inorganic iron, (2) if dandruff is present the scalp should be shampooed twice weekly with tar shampoo (3) foci of infection such as diseased tonsils and adenoids, abscessed teeth and infected sinuses should be eradicated or treated, (4) chronic constipation should be overcome when necessary by mechanical means, by the use of stewed fruits and fruit juices or by adequate doses of aromatic fluidextract of cascara sagrada, (5) sufficient rest should be secured, both positively through adequate sleep and negatively by the avoidance of fatigue; (6) excessive fat, highly seasoned foods, condiments and foods with high fat content such as pork, liver bacon, nuts and chocolate should be avoided. Indeed, excessive intake of fatty foods is thought to be the cause of most acne cases. Chocolate is not only a fat, but also allergenic and constipating.

The purpose of *topical agents* is to cause desquamation or peeling of the papules. Comedones should be removed only if they are large. The keratolytic effect of an alkaline soap (floor soap) made into a paste and allowed to remain on the face for a considerable time will frequently soften small ones. This is followed by applications of an ointment of salicylic acid and resorcin in lanolin-petrolatum base. The following prescription is an example

℞

Resorcinol (2 3%)	6 0-9 0
Salicylic acid (2 3%)	6 0-9 0
Hydrous wool fat	4 0
Petrolatum q ad	30 0

Misce et fiat unguentum
Signa: Apply before bedtime
Indication. For comedones

Various proprietary preparations are available containing sulfur and depending on the action of sulfides and polysulfides. The official White Lotion U.S.P (lotio alba) is too weak and should be either doubled or tripled in strength for keratolytic effect. Sulfurated Lime Solution

ture and general constitutional weakness and ill health. Male infants apparently are more often affected than females

Clinical Picture.—The clinical picture of acne (Fig 193) is well known. Usually with the onset of puberty the skin of the face and chest becomes greasy and oily and develops papules pustules and nodules with a surrounding erythematous area. The primary lesion the comedo (Fig 194) represents a small amount of sebum from the pilosebaceous gland which has become oxidized and a hyperkeratotic scale which plugs the outlet of the sebaceous duct. Some acne lesions dry up and disappear only to be followed by fresh ones. The lesions may become indurated, cystic (Fig. 195) or complicated by scars and atrophic changes. Secondary infection due to trauma induced by scratching is not uncommon.

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[illegible] for [illegible] weeks [illegible] and [illegible] for [illegible] weeks [illegible] and then [illegible] for [illegible] weeks.

REFERENCES

Love, W. [illegible], and [illegible]: Arch. Dermat. & [illegible] February [illegible]

[illegible], [illegible]: A.M.A. Arch. Dermat. & [illegible] June [illegible]

N F (Vleminckx s solution) is perhaps one of the best keratolytics. It should be employed as hot as it can be borne in mild concentration at first, 1 or 2 teaspoonfuls to a pint of water The strength should be increased gradually to 1 tablespoonful. *It should be applied hot for 15 minutes* Because Vleminckx s lotion discolors



Fig. 195.—Cystic acne. Note the numerous cysts on the face and the comedones. There was also a large sebaceous cyst behind the left ear

enamel earthenware and tarnishes jewelry such articles should be put away when it is employed. Another disadvantage is its rotten egg odor Sulfur ointments in 20-25 per cent strength incorporated in a zinc oxide ointment base have been found useful.

Large boggy cystic lesions containing pus certainly should be incised and drained. Cystic acne responds beautifully to roentgen therapy but this should be carried out only by a skilled dermatologist or radiologist.

Some acne patients show definite improvement when 50 000 units of *vitamin A* are taken twice daily for three weeks followed by a rest period of one week. This procedure may be continued for several months. However I am unwilling to rely on vitamin A alone.

Good results have been obtained with *estrogens* when ovarian dysfunction is the cause. Progynon B used alone or with x ray therapy is effective when acne is found to be intensified before the menstrual period. The estrogen should not be given haphazardly *Beginning the* 12th day after onset of the menses by which time the level of the hormones has sunk low 25 000 units is injected daily for three or four injections to a total of 75 000 to 100 000 units.

Freshly prepared, desiccated *tablets of thyroid* have been advocated by the Suttons, who claim good results from comparatively small dosage. They insist that the virtue of the action lies in the ability of thyroid to diminish hyper *lipemia by aiding the burning of oil* much as insulin aids the burning of sugar The dose, however they caution, must be regulated according to the symptoms. At the same time it should be remembered that thyroid and vitamin A neutralize each other accordingly they should not be given together

Staphylococcic toxoid and autogenous vaccine are of value in some cases. Some authorities have stressed the practical importance of prescribing *antibiotics* Their use has been often helpful but just as frequently it has failed. *Ultraviolet light* will yield temporary improvement but is not specific. Acne patients are always improved in summer because ultraviolet rays keep the skin dry Dermatologists are employing *roentgen therapy* less frequently and in less quantity for the treatment of acne because x rays affect the sebaceous glands. However cystic acne does respond beautifully to roentgen therapy

Most dermatologists agree that acne patients do much better when given a low fat, moderate carbohydrate and moderate protein diet.

Representative Prescriptions

R

Sulfurated potash		
Zinc sulfate	aa	7.8
Glycerin		12 0
Acetone		48.0
Calcium hydroxide solution	q.s. ad	180 0

Misce et fiat lotio
Signa. Apply nightly
I dication Keratolytic lotion

(J Belisari

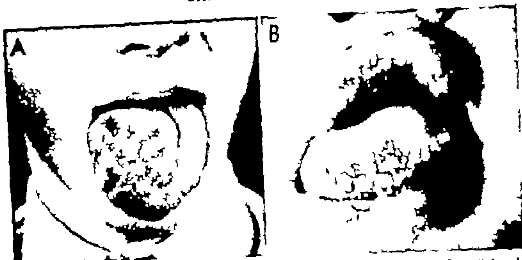


Fig. 196.—Angioma and lymphangioma of the tongue. A, angioma in a boy 15 years of age. B, lymphangioma in an infant of 8 months in whom an enlarged tongue was noticed at birth. The tip of the tongue presented a number of verrucose-like protuberances covered by a whitish membrane. Some areas of the tongue were hemorrhagic and the undersurface appeared edematous. Surgical excision of the growth resulted in adequate improvement. (A courtesy of Dr Thomas Butterworth.)



Fig. 197.—Aphthous stomatitis. (Courtesy of The Children's Hospital, Philadelphia.)

sionally. Marked redness and swelling of the gums with a tendency to bleed easily usually accompanies the lesions. Older children may complain of soreness of the mouth and pain during mastication; younger children and infants may refuse to eat or drink. The temperature usually is slightly elevated but it may remain normal. The cervical lymph nodes may be enlarged.

In *primary herpetic gingivostomatitis* the initial infection is frequently preceded by some disease process, such as an upper respiratory infection, infectious mononucleosis or a gastrointestinal upset which lowers the customary resistance to the virus. The onset is frequently insidious and the early symptoms are mild and nonspecific. The infant cries without apparent reason, is irritable, fretful, drools excessively and frequently refuses food and fluids. Older children are irritable, fretful, quarrelsome, lack normal interest in play, are lethargic, complain

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Diseases of the Mouth and Tongue

AS FAR BACK as the anterior portion of the pharynx, the mucous membrane of the mouth is ectodermal in origin like the skin of which it is a continuation Lesions of the mouth and tongue may occur as local disorders, as manifestations of systemic disorders or infections or as part of generalized skin eruptions. Thus again like those of the skin, lesions of the mouth and tongue may be found in certain diseases caused by micro-organisms and fungi in certain nutritional deficiency diseases and in certain blood dyscrasias and they may also be purely local disorders or else accompany dermatoses elsewhere on the body Every pediatrician knows that many of the exanthems are characterized by enanthems which may indeed precede the skin eruption and in some instances clinch an uncertain diagnosis. The fact that oral lesions may constitute an index to an underlying disorder emphasizes the importance of oral examination by dermatologist and pediatrician alike.

Among congenital anomalies of the mouth and tongue, angiomas and lymphangiomas of the tongue (Fig. 196) are not uncommon

Aphthous Stomatitis
(Canker Sore)

Aphthous stomatitis is a self-limited disease of the mouth, chiefly in children characterized by the occurrence of discrete vesicles in groups followed by ulceration. It is probably caused by the herpes simplex virus. The initial infection (primary herpetic gingivostomatitis) occurs during infancy or early childhood That the infection is acquired during early life is demonstrated by the presence almost universally of herpes virus neutralizing antibodies in the serum of adults. Also interesting is the fact that the residual virus, which is intracellular remains present among the cells indefinitely following the initial infection, in spite of the later presence of neutralizing antibodies in the blood, and at certain times, this residual virus may become activated and produce discrete lesions in a specific area of the body Factors causing activation of the latent virus include mild exposures to sunlight frequently associated with upper respiratory infections, cold sores, the elevation of body temperature in systemic diseases such as infectious mononucleosis as well as allergic reactions and menstruation.

The lesions of aphthous stomatitis consist of numerous reddish blisters or papulovesicles located on the mucous membranes they ulcerate early leaving shallow ulcers covered by a yellowish white membrane and surrounded by an erythematous zone (Fig 197) The commonest sites are the tongue, inner surface of the lips buccal and sublingual mucous membranes the outer mucous membrane of the lips, the soft palate tonsils and posterior pharynx are less frequent sites and the larynx is affected occa-

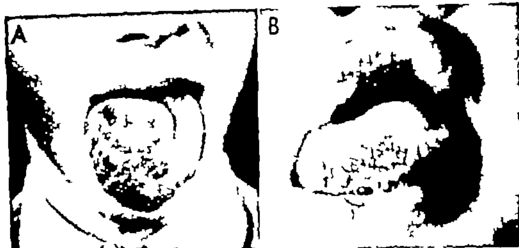


Fig. 196.—Angioma and lymphangioma of the tongue. A, angioma in boy 15 years of age. B, lymphangioma in an infant of 8 months in whom an enlarged tongue was noticed t birth. The tip of the tongue presented number of verrucose-like protuberances covered by a whitish membrane. Some areas of the tongue were hemorrhagic and the undersurface appeared edematous. Surgical excision of the growth resulted in adequate improvement. (*A* courtesy of Dr Thomas Butterworth.)



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of headache soreness of the neck, and pain on swallowing Within a day or two after the appearance of the ulcer *they complain of a sore mouth*. In some patients especially the extremely young the symptoms are complicated by dehydration and acidosis. After the prodromal stage, the occurrence of the typical oral *manifestations causes the patient to seek aid*

The *diagnosis* is made on the basis of the clinical picture already described. In differential diagnosis it should be remembered particularly that in aphthous stomatitis the ulcer is superficial *and healing is relatively rapid in* contrast to *periadenitis mucosa necrotica recurrens* there is no interdental necrosis as there is in *Vincent's infection* in which also the fusiform bacilli and spirilla of Vincent will be found *there is fever and lymphadenopathy in the acute* type but not in *chemical stomatitis* in which also the history is diagnostically helpful there are no constitutional symptoms as there are in *allergic stomatitis* the lesions do not occur on *the conjunctivae and other mucous membranes* as they may in the bullous type of *erythema multiforme* there is no swelling of the gums as there is in *scurvy* and there is not the red tongue characteristic of *pellagra* the exudate is easily *removable in contrast to the closely adherent membrane of diphtheria* and appropriate laboratory examinations will be helpful in ruling out *syphilis* and *leukemia*

As a rule the ulcers heal spontaneously *without scarring within two or three weeks.*

Since herpetic stomatitis is a communicable disease children *subject to the infection should* be isolated until all evidence of the disease has disappeared *Prophylaxis* should include good and proper hygiene of the mouth and the avoidance so far as possible of any infection (particularly upper and lower respiratory infection) which might tend to activate the virus The patient's eating utensils should be kept separate and be sterilized by boiling. The use of revaccination with smallpox vaccine has not proved successful in the writer's experience.

Treatment should be symptomatic and palliative. The diet should be bland, liquid and non irritating. Fruit juices (orange, grape tomato) because they are likely further to irritate the inflamed mucous membranes of the mouth, are *best avoided. Pain in the mouth may be so severe as to necessitate the use of a straw when drinking liquids so as to avoid direct contact with the inflamed areas.*

Aureomycin in adequate doses (50 to 100 mg every four hours by mouth) should be administered at the earliest discovery of the lesions in order to overcome the symptoms and to prevent secondary infection. Penicillin (aqueous) in doses of 300 000 units should be given intramuscularly every four hours during the height of the infection.

Mild antiseptic mouth washes such as the *alkaline aromatic solution 1 teaspoonful to a* glass of warm water may be prescribed freely In the more stubborn cases the mouth may be thoroughly washed with 1 30 000 potassium permanganate solution or a 1 per cent solution *of peroxide of hydrogen used as a mouth rinse* after each meal. Also in stubborn cases the individual lesions may be touched up with a 1 per cent solution of silver nitrate. Equally useful are topical applications of antiseptic drugs *and antibiotics especially Aureomycin in the* form of an ointment or a paste to reduce the secondary infection and to promote healing of the lesions.

Representative Prescription

℞

Procaine hydrochloride (1%)	0 9
Distilled water	90 0

Misce et fiat

Signa. Apply to mucous membranes of the mouth ten minutes before feeding

Indication. For severe pain causing refusal of food

(Lust Levbsohn)

See Formulary ℞ 4 (prescribed as 1 per cent solution applied by means of a cotton applicator to ulcers once or twice daily) and 79 astringents.

Black Hairy Tongue

Black hairy tongue is a local condition characterized by an overgrowth of the filiform papillae on the dorsum *of the tongue* which gives the superficial appearance of hairs. The cause is unknown and the pathology is obscure Some authorities believe that an infective process is the causative factor *Others consider it to* be a simple hypertrophy of the lingual papillae with pigmentation. The color of the tongue also

has been attributed to bacteria and fungi. Some state that the color of the growth appears to depend on the chromogenic properties of some particular responsible organism. The condition has followed parental injections of penicillin, chewing of penicillin lozenges and treatment with Aureomycin and chloramphenicol.

The essential features are the color which is most often either brown or black, and the overgrowth of the papillae on the dorsum of the tongue. The filaments appear elongated, fine and situated rather closely together with an appearance like that of hair or a dog's wet fur. They may become as long as an inch. The condition is asymptomatic but it may set up an irritation and a tickling sensation in the throat.

Diagnosis depends on the clinical picture already described. Drugs (e.g., example, Aureomycin) may cause a similar discoloration but without the elongation of papillae.

There are no complications. The condition improves although its duration may be weeks or months. A complete physical examination should be carried out in a search for other abnormal conditions. As therapeutic measures, mild mouth washes are of value. Exfoliative measures, such as lightly painting the tongue with 40 per cent of trichloracetic acid, may be helpful. Another method of treatment consists in shaving off the growth with a dull knife and then applying a per cent solution of salicylic acid or a 3 per cent iodine solution.

Cancrum Oris

(Noma)

Cancrum oris is a highly progressive, destructive disease affecting chiefly the cheeks and lips and occurring in debilitated persons. It is more common in children than in adults. No organism or group of organisms has been universally accepted as pathognomonic of noma. However it is commonly held that they must be anaerobic and perhaps exceedingly virulent. The disease not uncommonly follows infections such as measles, German measles, typhoid and typhus fever, pertussis, dysentery and pneumonia as well as leukemia, agranulocytosis and other debilitating diseases and sometimes trauma. Dietary insufficiency resulting in the lowering of the vital resistance is another factor in etiology as are hypo- and agammaglobulinemia.

The lesions are located on the cheeks and lips and the course progresses rapidly. The lesions may first be noticed as bluish or grayish vesicles on the gingivae or on the cheek. As a rule there is the history of an abrasion of the buccal mucous membrane, which soon becomes inflamed. Soon afterward signs of necrosis appear (Fig. 198). Early there are drooling of saliva and fetid breath. On the gingivae the necrosis soon exposes the alveolar process; the teeth of the affected region become loose and often drop out. When the mucous membrane of the cheek is affected, the disease is already far advanced. However the diseased mucous membrane of the cheek appears as a localized erythematous indurated area which in a few days becomes edematous, then turns black and in another day or two perforates. There is little or no bleeding (due to thrombosis of the blood vessels) and little if any pain. Itching on the other hand may be severe. The lymph nodes are usually swollen and tender. The temperature usually ranges between 101 and 103 F. Children may complain of loss of appetite, digestive disturbances and prostration.



Fig. 198.—Cancrum oris in girl 6 years of age. The necrotic area involves the left side of the face, upper lip and mouth. (By permission from Shrand, H. The Journal of the Cape Town Post-Graduate Medical Association, vol. 6, 1947.)

Diagnosis is based on the clinical picture already described. The putrid odor of the breath is characteristic. The condition is easily recognized and unmistakable. The necrosis may spread to ears, nose and even eyelids and to the external genital organs Diarrhea is common Marked deformities may remain where there is recovery after perforation

Prophylaxis and Treatment—Prophylaxis should include proper oral hygiene and measures to improve the patient's resistance (a well balanced diet including multivitamins) Immunization procedures routinely carried out by the pediatrician should not be neglected Carious and broken teeth should receive prompt attention. Secondary anemia calls for the use of hematinics. General measures to improve the resistance by the use of a high protein diet are indicated The diet should be nutritious at the height of the disease, yet should be one easily digested and assimilated. Blood transfusions may be useful and should be employed when indicated

The necrotic tissue loosened teeth and alveolar sequestra should be removed. Mouth irrigations with 1 1 000 of potassium permanganate solution should be used twice daily or more often when necessary Sloughs debris and exudate may be removed mechanically by using a warm rinse of normal saline solution at half hour intervals. Topically a 1 to 2 per cent of acriviolet may be prescribed.

Cheilitis

Cheilitis is an inflammatory condition of the lips usually chronic, characterized either by exfoliation or by an enlargement of the lips affecting the mucous glands. It may be due to a variety of causes such as actinic rays of sunlight cold urticaria carmine and other aniline dyes in liquid rouge dental plates (hecolite) eosin (in lipstick) denture creams containing oil of anise, lipstick in which local factors play a part mouth washes wax amalgam tooth fillings toothpastes hexylresorcinol in lozenges and in toothpaste metal of lipstick containers, volatiles such as the oil of orange in bubble gum strong artificial lights such as carbon arc, and liquid lip rouge. It appears th t bromofluorescein dyes are the most frequent offenders. The habit of licking and biting the lips is another cause, or it may be caused by atopic dermatitis.

Thus a possible cause is the use by children of make-up when "playing grown-up especially common in the teens. The precipitating factor in lipstick cheilitis is the idiosyncrasy to and/or direct chemical irritation from the indelible dyes. Physical factors to be considered in diagnosis are trauma from contamination salivation, light, biting or licking of the lips and the previous irritation of a susceptible site. Systemic disease and drug eruptions also may be responsible

The signs vary Mild cases are characterized by redness and perhaps the presence of a small amount of exudate. When the exudate dries, it may cause a dryness of the lips and a few crusts. The lips may be found stuck together upon awakening in the morning. In persistent (chronic) cases the lips are usually dried somewhat fissured in a way often resembling a collodion coating (Fig 199) Small nodules, not unlike small peas, may be felt when the lips are palpated and represent the enlarged mucous glands of the lips. The usual complaints include a burning sensation and pain of the affected parts, the latter as a rule being caused by fissuring of the lips. There may be difficulty in the mastication of food Children affected may become emotionally unstable and maladjusted

A *diagnosis* can be made from the history (the use of a contactant) and from the characteristic signs described Cheilitis should be differentiated from chapping of the lips, herpes simplex angioneurotic edema eruptions due to drugs, syphilitic rhagades, papules and chancre, avitaminosis and such general conditions as lupus erythematosus, lichen planus and bullous erythema multiforme described elsewhere.

Prophylaxis and Treatment—An attempt should be made to discover the cause of the condition and to correct it. Precipitated chalk should be used instead of toothpastes and dentifrices. Biting and licking of the lips should be discouraged. In lipstick cheilitis the use of lipsticks free from bromofluorescein dyes will clear up the condition in a few weeks. The use of a mild emollient, such as equal parts of lanolin and petrolatum applied to the lips before retiring will generally prevent the lips from becoming glued together overnight. Destructive methods (excision of the cysts cauterization

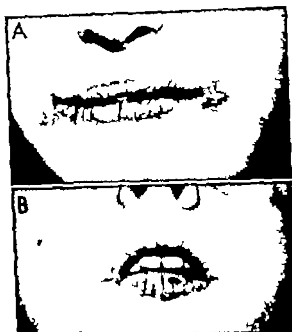


Fig. 199.—Cheilitis. A, In girl 9 years of age. Note the erythema, edema and excoriations on upper and lower lips. B of six months duration in girl 10 years of age in whom it was a contact dermatitis from the rind of an orange. Note the fissures, erythema and crusting. (A courtesy of Dr Robert L. Brent.)

radiation and x-ray therapy) have been followed by improvement in many instances. Such methods should be used only by a dermatologist skilled in their use.

Mild topical remedies (e.g., a paste consisting of aluminum acetate 10 parts, anhydrous lanolin 70 parts, and the simple Zinc Oxide Paste [U.S.P.], 30 parts) are often beneficial. For cheilitis due to moniliasis, a 1 2 per cent aqueous solution of gentian violet should be used twice daily. The writer has found 0.5 per cent aqueous solution of scarlet red or 0.5 per cent solution of acriflavin of value as a topical remedy.

Fordyce's Disease

Fordyce disease is a chronic condition of the lips and mucous membrane of the mouth characterized by minute milium-like lesions without subjective symptoms. The condition is by no means uncommon in children. Opinions differ as to its true nature. Congenital anomalies of the sebaceous glands and hypertrophy of the sebaceous glands have been cited as causes. The lesions consist of minute, yellowish or whitish-yellow papules or macules on the mucous membrane of the lips, cheeks and less frequently on the gums. The lesions are as a rule found on the vermilion border of the lips and on the mucous membrane of the cheeks on a level with the teeth. The *diagnosis* is made by the characteristic appearance of the lesions described and by their persistency. Often the condition is discovered *accidentally*. Lichen planus may possibly cause some diagnostic confusion, but not if it is remembered that in the latter the papules are reticular or annular and are covered with a whitish membrane and the characteristic polygonal papules may also be seen on the skin. There are no specific remedies. Proper oral hygiene is helpful.

Furrowed Tongue

(Scrotal Tongue)

This condition is congenital and occasionally familial. Syphilis also may be responsible.

Diagnosis is based on the clinical picture already described. The putrid odor of the breath is characteristic. The condition is easily recognized and unmistakable. The necrosis may spread to ears, nose and even eyelids and to the external genital organs. Diarrhea is common. Marked deformities may remain where there is recovery after perforation.

Prophylaxis and Treatment—Prophylaxis should include proper oral hygiene and measures to improve the patient's resistance (a well balanced diet including multivitamins) Immunization procedures routinely carried out by the pediatrician should not be neglected. Carious and broken teeth should receive prompt attention. Secondary anemia calls for the use of hematinics. General measures to improve the resistance by the use of a high protein diet are indicated. The diet should be nutritious at the height of the disease, yet should be one easily digested and assimilated Blood transfusions may be useful and should be employed when indicated.

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Thus a possible cause is the use by children of make-up when "playing grown-up" especially common in the teens. The precipitating factor in lipstick cheilitis is the idiosyncrasy to and/or direct chemical irritation from the indelible dyes. Physical factors to be considered in diagnosis are trauma from contamination, salivation, light, biting or licking of the lips and the previous irritation of a susceptible site. Systemic disease and drug eruptions also may be responsible.

The signs vary Mild cases are characterized by redness and perhaps the presence of a small amount of exudate. When the exudate dries, it may cause a dryness of the lips and a few crusts. The lips may be found stuck together upon awakening in the morning In persistent (chronic) cases, the lips are usually dried, somewhat fissured in a way often resembling a collodion coating (Fig. 199) Small nodules, not unlike small peas may be felt when the lips are palpated and represent the enlarged mucous glands of the lips. The usual complaints include a burning sensation and pain of the affected parts the latter as a rule being caused by fissuring of the lips. There may be difficulty in the mastication of food. Children affected may become emotionally unstable and maladjusted.

A *diagnosis* can be made from the history (the use of a contactant) and from the characteristic signs described. Cheilitis should be differentiated from chapping of the lips, herpes simplex, angioneurotic edema, eruptions due to drugs, syphilitic rhagades papules and chancre, avitaminosis and such general conditions as lupus erythematosus, lichen planus and bullous erythema multiforme, described elsewhere

Prophylaxis and Treatment—An attempt should be made to discover the cause of the condition and to correct it. Precipitated chalk should be used instead of toothpastes and dentifrices. Biting and licking of the lips should be discouraged. In lipstick cheilitis the use of lipsticks free from bromofluorescein dyes will clear up the condition in a few weeks. The use of a mild emollient such as equal parts of lanolin and petrolatum applied to the lips before retiring will generally prevent the lips from becoming glued together overnight. Destructive methods (excision of the cysts, cauterization,

ic is that they disappear in one area only to reappear in some other area of the tongue. The lesions are restricted to the dorsum but at times may invade the tip of the tongue, its sides and even the under surface. Indeed, in some instances the mucous membranes of the lips, palate and cheeks have been found to be involved. The condition as a rule is asymptomatic.

Diagnosis is simple. The characteristic red, circumscribed, shiny denuded areas on the dorsum of the tongue are unique, with their sharply defined borders, their healing in one area and reappearing on another and changing their position from day to day. In children the *syphilitic erythematous mucous patch* may possibly cause diagnostic confusion but darkfield examination will settle the matter.

There are no complications and the prognosis is good. The condition eventually disappears. Recurrences are not uncommon.

Treatment is seldom required. A physical examination should of course be carried out routinely and disorders corrected when they are found. The use of vitamin B complex and injections of crude liver extract have been found useful in many cases. Mild astringent and cleansing mouth washes should be employed. The use of 3-5 per cent anaesthesin or procaine hydrochloride ointment has been suggested when excoriated surfaces become painful. The patient should be cautioned to avoid highly spiced and acid foods.

Representative Prescription

℞

Anaesthesin	0 9
Peruvian Balsam	4 0
Cornstarch	12 0
Lanolin	16 0
Petrolatum q. ad	45 0

Misce et fiat unguentum.
Signa: To be rubbed in upon previously dried spots.

(Prinz)

Median Rhomboid Glossitis

This benign disease of the tongue is characterized by the presence of a mass or plaque, ovoid or rhomboid in shape, situated in the midline of the dorsum of the tongue, just anterior to the V formed by the vallate papillae. It is rare in children. Because the condition mainly affects middle aged males, it has been theorized that it may possibly represent a persistence of the tuberculum impar (a developmental anomaly of the tongue).

The typical lesion consists of a non-nucleated rhomboid or ovoid mass or plaque situated in the mid-line of the dorsum of the tongue just anterior to the V formed by the circumvallate papillae. The deep red-colored mass is usually slightly raised above the rest of the tongue and, being devoid of papillae, forms a definite contrast to the surrounding area, which is papillated and often coated. The mass is always sharply limited posteriorly by the sulcus terminalis. It is often nodular and occasionally fissured. Again the surface may be smooth and glistening or occasionally furred and mammillated. There is no surface ulceration but the mass is always definitely indurated. Pain and tenderness are absent and there are no subjective symptoms. The condition is most often discovered accidentally.

The condition is chronic and may persist almost indefinitely. Active therapy is not indicated. In subjects in whom the tongue is fissured, proper oral hygiene following the ingestion of food is especially important because food particles in the fissures may set up irritation.

Mucous Cyst

The supposed cause of mucous cysts is trauma that results in a plugging up and consequent dilatation of the labial glands. The cyst, usually single, occurs most often on the lower lip at a point adjacent to the left bicuspid and less commonly on the tongue. The cyst, fluctuant and somewhat tense, varies in size from pea to cherry. Usually it enlarges, ruptures and extrudes a gelatinous material and then refills. It is recognizable as a small, globular fluctuant mass containing a gelatinous substance, located either on the lower lip or on the tongue. It can be distinguished from angioma by the bluish-red color of the latter.

Surgical excision is the treatment of choice. Under procaine (1 2%) anesthesia, the cyst is excised and the base cauterized, usually either by phenol followed by alcohol or by cautery

Usually the tongue is large and marked by deep grooves or furrows. The condition has been likened to the surface of the scrotum with the raphe in the center and plications emanating



Fig. 200—Furrowed tongue in a young girl. Note the deep grooves on the sides of the tongue.

from it (Fig. 200) hence the term, "scrotal tongue. In reality the grooves are merely pli cations of the mucous membrane on the dor sum of the tongue. The condition is asymptomatic The condition once seen will present little difficulty in diagnosis A *cerebriform nevus* may possibly cause some confusion. However in the latter condition, the lesion as a rule af fects only one half of the tongue by furrow ing in scrotal tongue, the entire tongue is af fected There are no complications although associated with it may be a mild glossitis, probably due to food particles and debris which ac cumulate in the cracks and set up a mild inflammation The condition is permanent and there is *no treatment* Mild alkaline mouth washes should be employed after meals to prevent ac cumulation of food fragments in the furrows. When superficial ulceration occurs, the lesions may be touched with a 1 per cent solution of silver nitrate

Geographic Tongue

Geographic tongue is a recurrent superfi cial migratory rash of the tongue with the formation of transitory benign plaques in a constantly changing pattern.

The exact cause is unknown. It is common during infancy and early childhood and it af fects both sexes. Some children appear un dernourished are delicate and anemic but the condition is also seen in quite healthy children. It is seen especially between the ages of 1 and 5 years and sometimes in two or more children of the same family It sometimes follows the exanthems

At first a small irregular depression or spot, perhaps the size of a pea, is noticed on the lat eral surface or the tip of the tongue By contrast with the rest of the tongue which is fur covered the lesion appears somewhat red and shiny Or there may be a number of small circles which appear somewhat depressed below the surface of the tongue. The area affected

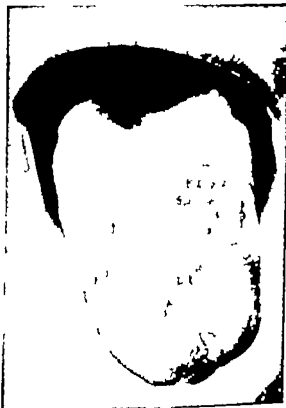


Fig 201—Geographic tongue in a girl 4 years of age

gradually widens into a circle and by peripheral and serpiginous expansion produces irregular spots which have been likened to the surface of a map (Fig. 201) The lesions are characteris

tic in that they disappear in one area only to reappear in some other area of the tongue. The lesions are restricted to the dorsum but at times may invade the tip of the tongue, its sides and even the under surface. Indeed in some instances the mucous membranes of the lips, palate and cheeks have been found to be involved. The condition as a rule is asymptomatic.

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Signa: To be rubbed in upon previously dried spots.

(Prinz)

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Surgical excision is the treatment of choice. Under procaine (1 %) anesthesia, the cyst is excised and the base cauterized, usually either by phenol followed by alcohol or by cautery.

Cyst of the Salivary Glands

These cysts emanate from the glands of Blandin and Nuhn which are located on the under surface of the tongue approximately 1 or 2 cm from the tip of the tongue on either side of the mid-line. *Treatment* consists in excision. A mere incision will be followed by recurrence.

Oral Moniliasis (Thrush) in Newborn Infants

This condition occurs mostly in the newborn *to whom the infection is transmitted during* passage through the birth canal It is discussed *in detail in the chapter on Fungous Infections* (p 268)

Papilloma of the Tongue

This condition usually the result of some irritation is occasionally met with in children The lesion, generally seen in the area of the papillae, resembles a wart (Fig. 202) It may be treated by snipping off with a pair of scissors or else by the application of 70 per cent trichloracetic acid. Once removed, the lesion seldom recurs.

Periadenitis Mucosa Necrotica Recurrens

This condition is characterized by the presence of ulcers which appear suddenly on the mucous membrane of the vulva or adjacent regions Similar lesions are also found on the mucous membrane of the mouth. Some observers regard the disease as a severe form of aphthous stomatitis.

The *Bacillus crassus is thought to be the re*sponsible organism The condition is commonly seen in adults but is not infrequent in childhood

The lesions consist of discrete pinpoint to pinhead sized hard indurated nodules involving the mucous glands of the lips cheeks and even tongue. Sometimes a slightly yellowish plaque with a little swelling may be seen instead of the indurated nodules. The nodule undergoes necrosis and quickly sloughs out leaving an area covered with fibrin The affected area soon becomes secondarily *infected and is sur*rounded by a peripheral border of erythema.

The ulcers heal slowly and are followed by scar tissue. Early the patient usually complains of a slight burning sensation of the affected area, which becomes quite painful after the ulcer appears Indeed, the pain may be so intense as to interfere with mastication.

Aphthous stomatitis can be differentiated by its faster healing without scars and the fact that the ulcers are shallower than those of periadenitis mucosa necrotica recurrens.



Fig. 202.—Papilloma of the tongue of two years duration in a boy 5 years of age. Note the two circumscribed somewhat elevated papules on the right side of the dorsum of the tongue. This child also had numerous warts (verrucae vulgares) on the fingers of both hands and a filiform wart at the mucocutaneous junction on the right side of the lower lip

The condition heals after a week or ten days but recurrences are common

In addition to the prophylactic measures outlined for aphthous stomatitis (p 452) general measures for improving the health of the individual are indicated, such as an adequate well balanced diet including vitamins especial attention to hygiene of the mouth rest, adequate sleep and abundance of sunshine.

Antiseptic mouth washes are often helpful *The ulcers may be treated by the application* of 1–3 per cent silver nitrate.

Dramatic response has been reported from use of a mouth rinse containing 250 mg. of Aureomycin (0.5 per cent) dissolved in 50 cc. of water. An Aureomycin paste (made by mixing Aureomycin powder with a little water) applied to a pharyngeal ulcer with a cotton applicator produced prompt healing in another case reported in the literature.

Perlèche

Perlèche is a fissuring inflammation of the oral commissures. It was so named from the French "pourlécher" to lick, by Lemaistre, who first described it. Three varieties have been described: purulent, eczematoid and polymorphic. In children it is either caused by streptococci or staphylococci or is part of the syndrome of avitaminosis B complex. Less commonly it is produced by monilia (Chapter 19). It appears to be more common in boys and it is seen with greatest frequency during winter.

Early in the disease, on the epithelium of both labial commissures is found a pinkish discoloration which soon becomes transformed into a whitish (mother-of-pearl) area. This region is a trifle macerated and the skin may be either adherent or wrinkled and easily detachable and surrounded by a reddish border. Vesicles may at times be found grouped at this site (Fig. 203). A few days later the wrinkled folds are seen to be deeper, better defined and spread out in a fanlike manner with the apex of the fan at the commissure. At this time the epithelium has disappeared and the base of the fissures become quite erythematous. The inflammatory scaling dermatitis is localized almost completely to the skin at the commissures, although the fissures may be seen extending outward and downward, in length from a few millimeters to several centimeters, from the angle of the mouth where they end abruptly at the mucocutaneous junction.

Subjective symptoms are generally mild. Patients complain of dryness or perhaps of a slight burning sensation, but deep infected fissures may be quite painful.

While the condition heals spontaneously, recurrences and exacerbations are the rule if the lesions remain untreated. Indeed perlèche may last for months and even years.

When riboflavin deficiency is demonstrated to be the cause, the oral administration three times daily of 1 mg. of riboflavin or of 1 oz. of brewer's yeast or intramuscular injection daily of crude liver extract will clear up the condition. Or the lesions may be touched up with 1–3 per cent solution of silver nitrate followed by ap-

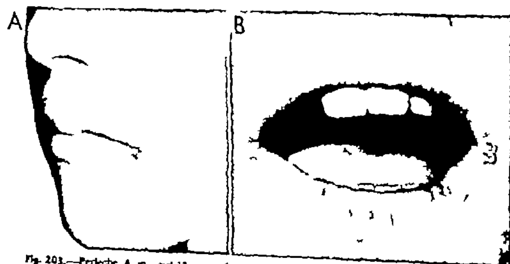


Fig. 203.—Perleche. A, in girl 13 years of age. Note the excoriated papule at the angle of the mouth. B, in girl 10 years of age. Note the macerated papules and fissuring of the oral commissures. There is also fissuring of the lower lip with crust formation.

plication of an emollient cream or of 1–2 per cent ammoniated mercury ointment The author has found weak dilutions of dalibour water serviceable used as a wet dressing.

See Formulary ℞ 4 for astringent prescribed as 1 per cent solution to be applied to lesions with cotton applicator once or twice daily 19 for wet dressing applied once or twice daily 36 for antiphlogistic ointment 66 for antiphlogistic and healing ointment when 1 per cent scarlet red has been added 71 for moniliicide applied with cotton applicator three times daily

Vincent's Infection
(*Trench Mouth*)

Vincent's infection is a bacterial relapsing disease of the mucous membranes of the tonsils and mouth characterized by ulceration and caused by the bacillus fusiformis and Vincent's spirillum which occur as symbiotic organisms.

The condition often follows abnormal or diseased gums, dental caries and diseased tonsils. Apparently it bears no relation to previous conditions in the child's health.

In infants and younger children anorexia and listlessness appear during the febrile period which precedes the appearance of oral signs. *Fever is moderate. Soreness of the mouth* appears quite suddenly and becomes worse after several days. *Infants are irritable and sleep fit*fully older children complain of pain and discomfort *Among the clinical signs, gingivitis is* the outstanding feature The odor of the breath of children suffering from acute gingival stomatitis is characteristic, and when once experienced will always be remembered.

The lesion may appear as a sloughing ulcer a series of vesicles or a frank stomatitis. The ulcers are tender superficial and often hyperemic and covered by a grayish membrane When the membrane is removed it leaves a raw bleeding surface The lesions usually are found on the gingivae, especially near the gum margin but any area of the mouth may be involved, even the pharynx or the lower respiratory tract.

The regional lymph nodes are almost always enlarged as a clinical sign this enlargement is second in frequency to gingivitis Salivation is frequently profuse and constant dribbling of the saliva frequently leads to excoriation of the lower lip

Diagnosis depends on the presence of the clinical signs already described. The disease runs an acutely spreading course Fusiform bacilli and spirillae are found on examination of a smear

The disease can be differentiated from diphtheria blood dyscrasias, scurvy poisoning by heavy metals and syphilis by means of appropriate laboratory examinations and in some instances by the history

The disease seldom lasts more than two weeks. It is benign and self-limited. Recurrences and second attacks are rare.

In general the prophylactic care is that already described for aphthous stomatitis. The mouth should be kept clean with antiseptic mouth washes. Proper attention should be given to the teeth dental floss should be used freely and food particles removed by a tooth brush after each meal Sources of mechanical irritation such as eroded and carious teeth, should be corrected.

During the acute stage of the disease the diet should consist largely of milk eggnog, fresh orange juice and other fruit juices and broths Hot, coarse and spicy foods, fried and fatty foods and starches should be avoided.

During the period of infection cleansing of the teeth with a toothbrush should be definitely avoided. The use of caustics, once common is to be condemned.

The antibiotics have replaced many of the older methods of local treatment. Aureomycin, 75 mg. powder has been used, incorporated in 1 5 Gm of a mixture of carbomethyl cellulose in a petrolatum base. Parental injection of aqueous penicillin in doses of 300 000 units intramuscularly should be administered several times daily during the height of infection Excellent improvement has been reported from the use of penicillin in the form of pleasantly flavored troches (1 000 units each) from an aqueous spray containing 500 units bacitracin per cc. and from penicillin in the form of a paste or ointment Bacitracin is to be preferred for patients who are either allergic to penicillin or penicillin fast

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